

Henry Hagg Lake
Resource Management Plan (RMP)
Draft Environmental Assessment (EA)

U.S. Bureau of Reclamation
Pacific Northwest Region
Lower Columbia Area Office



May 2003



IN REPLY REFER TO:

PN-3902
LND-8.00

United States Department of the Interior

BUREAU OF RECLAMATION

Pacific Northwest Region
Lower Columbia Area Office
825 NE Multnomah Street, Suite 1110
Portland, Oregon 97232-2135

MAY 05 2003

Subject: Release of the Draft Environmental Assessment (EA) for the Henry Hagg Lake Resource Management Plan (RMP), Tualatin Project, Oregon

Dear Interested Party:

Enclosed you will find the Draft Environmental Assessment (EA) for the Henry Hagg Lake Resource Management Plan (RMP). As you may know, a planning process has been going on for the last 2 years involving Federal, state, and local government, Tribal, and interested members of the public, to develop alternatives for managing the natural, cultural, and recreational resources around Henry Hagg Lake. This document presents and evaluates these alternatives for public consideration and comment.

A final RMP will be completed after a decision is made on the alternatives. The final RMP will provide management guidance for the land and water resources under Reclamation jurisdiction for the next 10 years.

The three action alternatives evaluated in the Draft EA combine various levels of recreation development and resource conservation. The No Action Alternative is required by law and evaluates the continued management of the area using the 1994 Recreation Development Master Plan. For this reason, you will find some "action items" listed in the No Action Alternative. The two Action Alternatives evaluate management of the area with varying degrees of recreation development and resource conservation.

We invite you to review and comment on this document. Your comments will be used to help us develop the final EA and RMP, and ultimately determine how this area will be managed for years to come. Please provide written comments, postmarked by **June 20, 2003**, to Ms. Carolyn Burpee Stone, PN-3902, Bureau of Reclamation, 1150 N. Curtis Road, Suite 100, Boise, Idaho, 83706-1234.

Our practice is to include copies of comments, including names and home addresses of respondents, along with our responses in the final EA for public review. Individual respondents may request that we withhold their home address from public disclosure, which we will honor to the extent allowable by law. If you wish for us to withhold your name and /or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public disclosure in their entirety.

If you have questions, or need additional copies of the document, please contact Ms. Carolyn Burpee Stone at 208-378-5395.

Sincerely,

A handwritten signature in black ink, appearing to read "Ron Eggers", written in a cursive style.

Ronald J. Eggers
Area Manager

Enclosure - 1

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ABBREVIATIONS AND ACRONYMS

af	Acre-foot
AF-10	Agricultural Forest – 10 (Land Use Designation)
AF-20	Agricultural Forest – 20 (Land Use Designation)
AF-5	Agricultural Forest – 5 (Land Use Designation)
AINW	Archaeological Investigations Northwest, Inc.
ARPA	Archaeological Resources Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practice
BOD	Biological Oxygen Demand
BP	Before present
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic feet per second
COE	U.S. Army Corps of Engineers
CWA	Clean Water Act
CWS	Clean Water Services
dB	Decibel
dBA	a-weighted decibel
DLUT	Department of Land Use and Transportation
DM	Department Manual
DO	Dissolved oxygen
EA	Environmental Assessment
EFC	Exclusive Forest and Conservation (Land Use Designation)
EFU	Exclusive Farm Use (Land Use Designation)
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FONSI	Finding of No Significant Impact
FWCA	Fish & Wildlife Coordination Act
GRFD	Gaston Rural Fire Department
HR	House Rule
HUWC	Hillsboro Utility Water Commission
IPM	Integrated Pest Management
ITA	Indian Trust Asset
IWG	Interagency Work Group
LOS	Level of Service
mph	Miles per hour
MPN	Most Probable Number
NAGPRA	Native American Graves Protection and Repatriation Act
National Register	National Register of Historic Places

ABBREVIATIONS AND ACRONYMS (CONTINUED)

NEPA	National Environmental Policy Act
NGO	Non-Government Organization
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NTU	Nephelometric Turbidity Unit
O&M	Operations & Maintenance
OAR	Oregon Administrative Rules
ODA	Oregon Department of Agriculture
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish & Wildlife
ONHP	Oregon Natural Heritage Program
ORV	Off-road vehicle
PAM	Planning Aid Memorandum
PL	Public Law
PSU	Portland State University
PWC	Personal watercraft
Reclamation	U.S. Bureau of Reclamation
R-IND	Rural Industrial
RM	River Mile
RMP	Resource Management Plan
SC	Sensitive Critical
SHPO	State Historic Preservation Office
SoC	Species of Concern
SOD	Sediment Oxygen Demand
SU	Sensitive Undetermined
SV	Sensitive Vulnerable
TCP	Traditional Cultural Property
TES	Threatened, Endangered, or Sensitive
TVID	Tualatin Valley Irrigation District
USA	Unified Sewerage Agency
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
WACCCA	Washington County Consolidated Communication Agency
WACO	Washington County Parks Department

1.0 Purpose and Need for Action

1.0 PURPOSE AND NEED FOR ACTION

1.1 Introduction

The U.S. Bureau of Reclamation (Reclamation) has prepared this Draft Environmental Assessment (EA) to evaluate alternatives for the proposed Resource Management Plan (RMP) for Henry Hagg Lake. Reclamation is developing the RMP in conjunction with its managing partner for Henry Hagg Lake, Washington County Parks and Recreation (WACO), to manage resources, facilities, and access on Reclamation lands and waters (Figure 1.1-1).

1.2 Authority

Title 28 of Public Law (PL) 102-575, Section 2805 (106 Stat. 4690; Reclamation Recreation Management Act of October 30, 1992) provides Reclamation with the authority to prepare resource management plans.

1.3 Proposed Federal Action

For this EA, the proposed Federal action is implementation of the RMP for Reclamation lands and resources at Henry Hagg Lake. The intent of the RMP is to serve as a blueprint for the future use, management, and site development of Reclamation lands and resources in the RMP study area for the next 10 years. Reservoir operations are not part of the RMP and are not considered in the RMP or this EA. The RMP identifies goals and objectives for resource management, specifies desired land and resource use patterns, and explains the policies and actions that would be implemented during the 10-year life of the plan to achieve these goals and objectives. Draft goals and objectives for the Henry Hagg Lake RMP are included as Appendix A.

1.4 Purpose and Need for Action

The purpose of this Federal action is to prepare an RMP to effectively manage recreation use and natural and cultural resources at Henry Hagg Lake. Reclamation currently does not have an RMP for its lands around Henry Hagg Lake. A plan is needed to address current and anticipated future issues to permit the orderly and coordinated development and management of lands and facilities under Reclamation jurisdiction at the reservoir. Henry Hagg Lake is the only large body of water for public recreation easily accessible from the Portland, Oregon metropolitan area. The region has experienced a large growth in population over the last 10 years. During this time, Washington County grew by 43% and Multnomah County, including Portland, grew by 13%, bringing the population of these two counties to more than one million people. An EA on recreation management alternatives was prepared in 1994 and is the document that guides current management at Henry Hagg Lake. Continued growth of the region and the corresponding use of Henry Hagg Lake require the development of an RMP to update the current outdated guidance and for resolving conflicts with natural resources and among user groups.

If implemented, the RMP would be used as the basis for directing activities on Reclamation lands and the reservoir in a way that maximizes overall public and resource benefits consistent with the purposes of the area; it would provide guidance for managing the area during the next 10 years. The RMP would

be reviewed, reevaluated, and revised to reflect changing conditions and management objectives on an as-needed basis. Opportunities for public involvement would be provided on significant changes that affect the resource or public use.

This EA is being prepared to determine whether to issue a Finding of No Significant Impact (FONSI) or a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act of 1969 (NEPA). NEPA requires the preparation of an EA for any Federal action that may have a significant impact on the environment.

NEPA requires Reclamation to explore a range of possible alternative management approaches and assess the potential environmental effects of these actions. Three alternatives are evaluated and compared in this document, including a No Action Alternative and a Preferred Alternative. The impacts of each alternative were evaluated for the following affected resource topics: hydrology and water quality; soils; vegetation; fish and wildlife; threatened, endangered, and sensitive (TES) species; recreation; land use; socioeconomics; public services and utilities; environmental justice; cultural resources; Indian sacred sites; Indian Trust Assets (ITAs); visual resources; and transportation and access. Project scoping and preliminary analyses of air quality, topography, paleontology, and geology indicated that there are no potential impacts to these resources; therefore, these resource topics are not further evaluated in this EA.

1.5 Location and Background

Henry Hagg Lake is located in western Washington County, Oregon, approximately 30 miles southwest of the city of Portland. The study area lies within the 38-square-mile drainage basin of Scoggins Creek, in the foothills of the Oregon Coast Range. The reservoir is an important recreation resource in the region, both for local residents as well as those from the Portland metropolitan area. As the region continues to grow, Reclamation expects that more people will use the area. This increasing recreation use, as well as the potential conflicts among recreation, aesthetic, and natural resources, is an important reason for preparing a management plan for the area's resources (Figure 1.5-1).

1.5.1 Historical Overview

The Willamette Valley has been occupied by humans for at least 8,000 years. At the time of the first Euro-American explorations in the 1800s the Tualatin Valley was occupied by the Tualatin Indians, including a winter village at the mouth of Scoggins Creek. In the 1840s a number of agricultural settlements and fur trading posts were established in the area. Historic farming in the Scoggins Valley was dominated by dairy operations prior to building of the dam.

Construction on Henry Hagg Lake began in 1972 and was completed in 1975 to provide irrigation service for the Tualatin Valley, municipal and industrial water supply for eight communities, flood control, recreation opportunities, maintenance of water quality, and fish and wildlife enhancement. Henry Hagg Lake is part of Reclamation's Tualatin Project, which supplies irrigation water to the Tualatin Valley, supplies municipal water to local communities, and provides flood control. With a surface area of 1,132 acres, the reservoir has a storage capacity of 59,950 acre-feet (af). The reservoir and surrounding park are owned by the United States, under Reclamation's jurisdiction, while water-

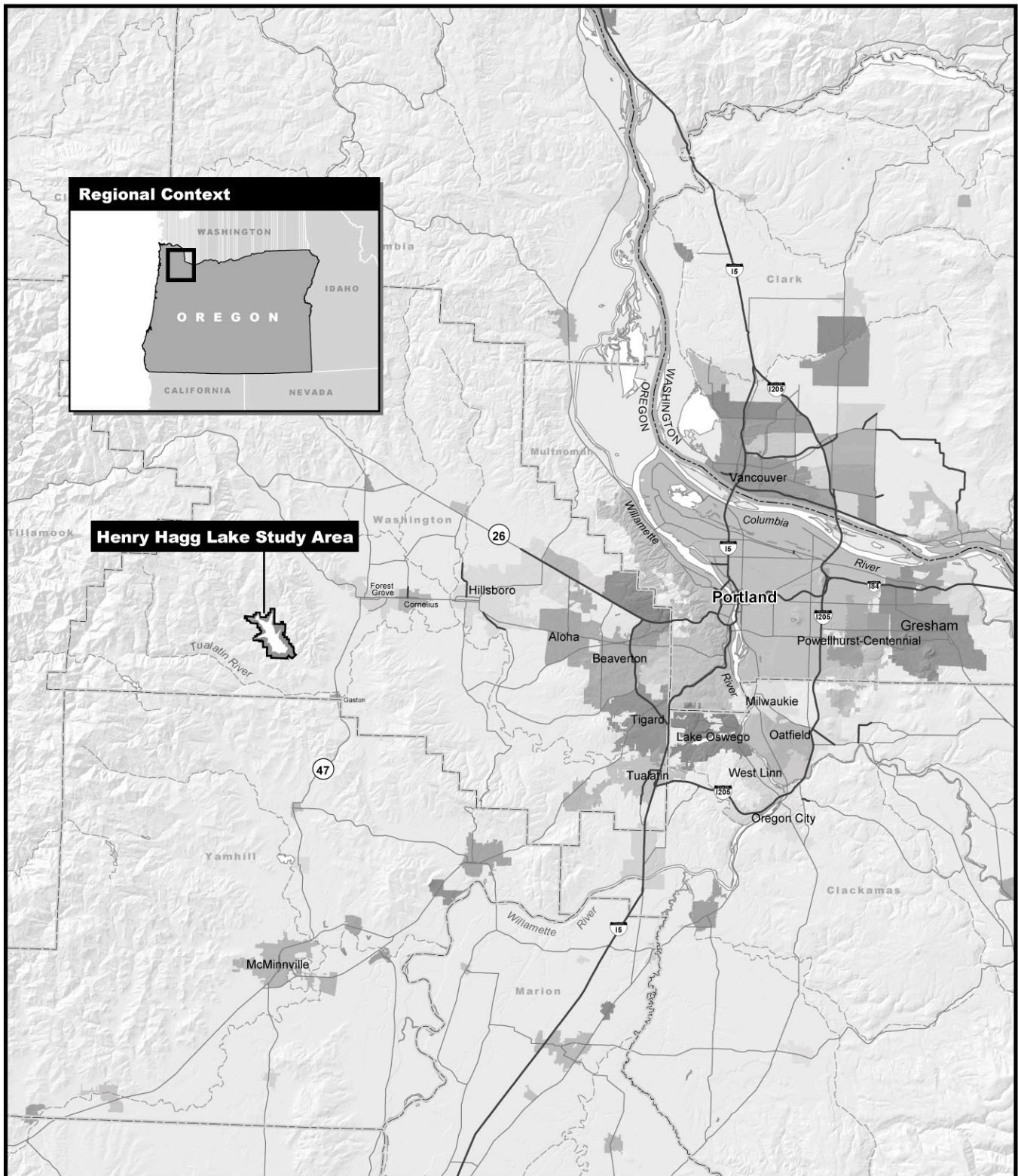
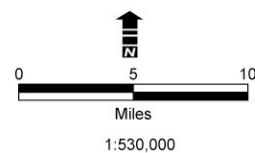


Figure 1.1-1
General Location

Henry Hagg Lake RMP
Draft Environmental Assessment

Highway
Stream
County Boundary
State Boundary



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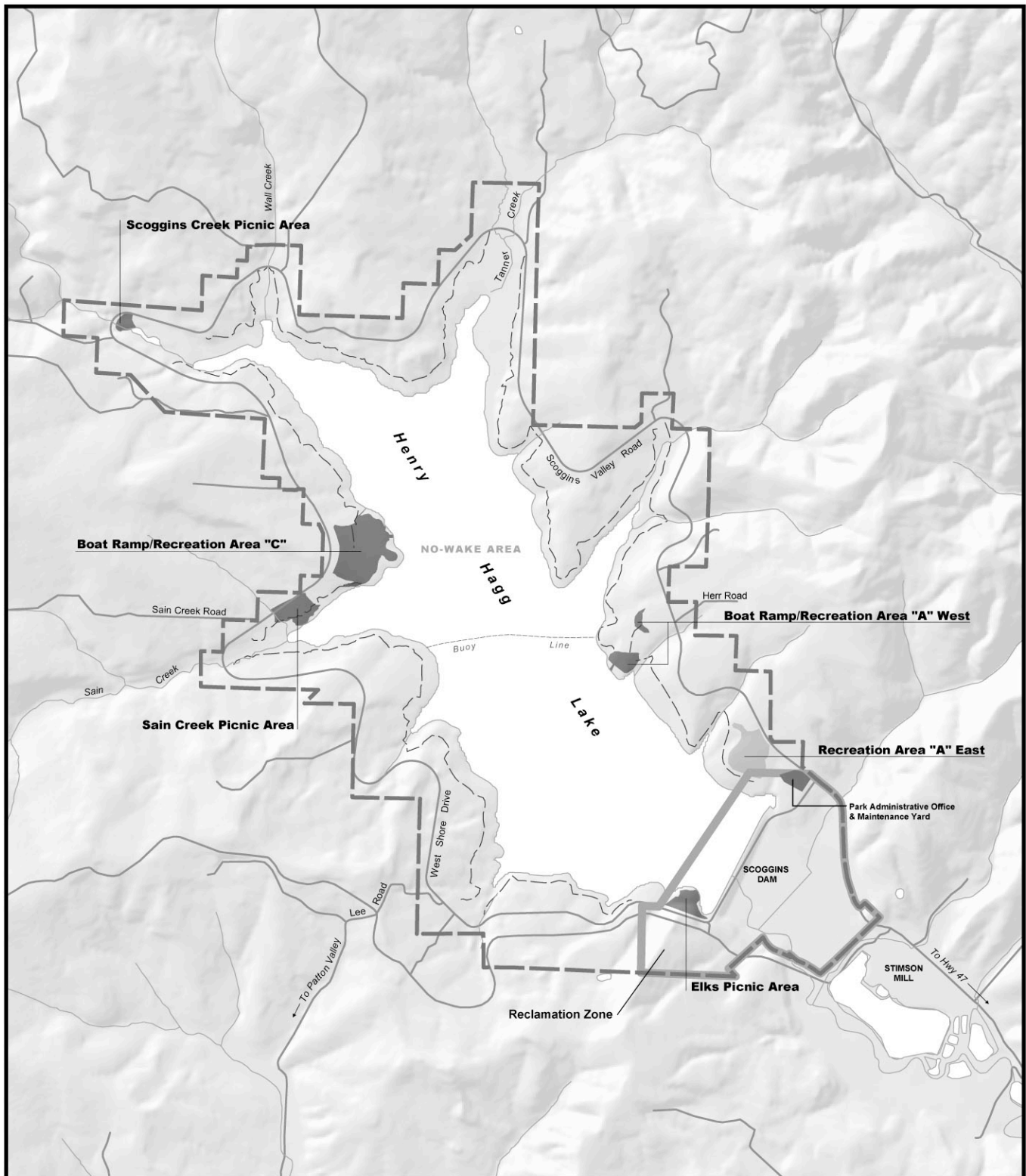
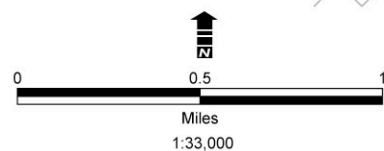


Figure 1.5-1
Henry Hagg Lake Area

Henry Hagg Lake RMP
Draft Environmental Assessment

- Park Facility or Recreation Site
- Recreation Site - Out of Use (Closed)
- Reclamation Lands
- Reclamation Zone
- Recreation Trail
- Road
- Stream



Back of Figure 1.5-1

related recreation features, natural resources, and lands of the surrounding park are managed, operated and maintained by WACO, Reclamation's non-Federal managing partner. The park features many day use picnic areas, two boat launches, a fishing pier, and several miles of trails. In 1973, WACO entered into a 50-year lease agreement with Reclamation for administration of Scoggins Valley Park for public outdoor recreation use and for fish and wildlife enhancement. Planning for the park facilities was done by the National Park Service (NPS) in 1970. Using the NPS plan, work began on park recreational facilities in 1975. As the facilities became available, they were opened for use by the public. The last NPS plan based facility was completed in 1978. Due to an increase in popularity and recreational use during the 1980s, WACO developed a Master Plan (1989) that identified additional or not yet developed recreational facilities to meet this growing demand. A 1994 NEPA EA evaluated three management options for Henry Hagg Lake (Reclamation 1994). The preferred alternative was chosen and provides the guidance under which the park is currently managed. The park is open from the first weekend in March through November 24th for day use.

1.5.2 Reservoir Operations

Reservoir operations are not part of the RMP or EA but are summarized to provide a general context. Henry Hagg Lake is the major storage reservoir facility of the Tualatin River Project and has an active storage capacity of 53,640 af and a water surface area of 1,132 acres at normal full pool elevation. The dam facilities are operated by the Tualatin Valley Irrigation District (TVID) under the general supervision of Reclamation's Lower Columbia Area Office in Portland. Reclamation's Bend Field Office, Bend, Oregon, and the Pacific Northwest Regional Office, Boise Idaho, provide the day-to-day contact/coordination with TVID on operational and maintenance issues associated with the project. The project must meet a minimum flow to Scoggins Creek below the dam of 10 cubic feet per second (cfs), except in October and November when releases must be 20 cfs. Irrigation and other water uses typically draw the reservoir down to about 22,000 af or less by November 1. Flood control rules do not allow the reservoir to fill above 33,040 af until after January 15, after which maximum levels are prescribed by a fill curve that does not allow the reservoir to fill completely before May 1. Temporary storage above the fill curve is only allowed during flood control events, after which the reservoir must be drafted back down.

TVID operates and maintains Scoggins Dam and water releases from the reservoir. During the year, the water surface level can fluctuate from a maximum of 1,132 surface acres of water to a minimum of 411 surface acres. TVID manages the reservoir with a goal of reaching 53,640 af on May 1 of each year. The high water level is maintained until orders are received from the various contracting entities and outflow demands exceed inflow. Project specifications are summarized in Table 1.5-1.

Reclamation's jurisdiction includes Henry Hagg Lake (1,132 acres) and adjacent lands (1,449 acres). Reclamation lands generally consist of a strip of land around the reservoir with about 11 miles of shoreline. Primary road access to Henry Hagg Lake is provided by Highway 47 and Scoggins Valley Road.

Table 1.5-1. Project specifications.

Normal Full Pool	
Elevation	303.5 ft
Active Storage	53,640 af
Surface Area	1,132 ac
Shoreline	11 mi
Minimum Pool (Inactive and Dead Storage)	
Elevation	235.3 ft
Storage	6,310 af
Surface Area	411 ac
Allocation of Capacity	
Active/Joint Use Storage	53,640 af
Inactive/Dead Storage	6,310 af
Scoggins Dam	
Structural Height	151 ft
Crest Elevation	313 ft
Crest Length	2,700 ft
Spillway Crest Elevation	283.5 ft

Source: Reclamation (2002)

1.6 Related Activities

1.6.1 Tualatin Valley Water Supply Feasibility Study

Washington County Clean Water Services (CWS) is a wastewater service agency serving 122 square miles in urban Washington County, small portions of Portland and Lake Oswego, and parts of Multnomah and Clackamas Counties. In response to increasing water use demands in the Tualatin River Basin, CWS, in cooperation with several municipalities and TVID, is preparing a Water Supply Feasibility Study (WSFS) and associated EIS to study alternatives for increasing water supply in the Tualatin River Basin. Reclamation is providing technical assistance in assessing alternative water supply source options, which include:

- Expansion of Henry Hagg Lake by raising Scoggins Dam 20 feet;
- Expansion of Henry Hagg Lake by raising Scoggins Dam 40 feet; and
- Exchange of Willamette River water for irrigation;

Options to be considered as components of all supply alternatives involve water conservation, waste water reuse, aquifer storage and recovery, and near-term additional supply from Portland. A No Action Alternative will also be analyzed.

The WSFS was started in November 2001 as a collaborative effort led by CWS. A preferred alternative is scheduled to be identified in early summer 2003. In preliminary studies, scientists and engineers identified potential water sources to be evaluated. These potential sources and the planned WSFS approach were presented for public review and comment during scoping meetings in January 2002. Subsequently, it is planned that information on alternatives, impacts, and possible mitigation will be presented to the general public for review. Public comments will become part of the body of knowledge used in selecting a preferred alternative. Because the preferred alternative might involve Federal action,

the study will complete the investigation and analysis necessary to develop a Planning Report and Environmental Impact Statement (PR/EIS) pursuant to NEPA. A draft PR/EIS would be presented to the public for comment under this scenario.

Raising the dam 20 or 40 feet would inundate most recreation facilities at, and portions of the road around, Henry Hagg Lake. While long-range timing is difficult to predict, implementation of the WSFS preferred alternative may occur in 2008, within the planning period for this RMP. Outcomes from the WSFS that would affect Henry Hagg Lake would be considered in the next RMP process. To ensure full coordination among the interested parties, both CWS and TVID are represented on the Ad Hoc Work Group for the Henry Hagg RMP process (see Section 4.0 for more information on the role of the Ad Hoc Work Group).

1.7 Scoping

To ensure that all relevant issues and a full range of alternatives would be considered during the NEPA process, Reclamation and WACO held a public scoping meeting on January 17, 2002 prior to the development of this Draft EA. The meeting was announced through media announcements sent to local outlets and a public information newsbrief sent to approximately 350 people. The purpose of the initial meeting and the newsbrief was to collect public input on the issues that should be addressed in the alternatives for the RMP and EA (referred to in NEPA as “scoping”). Following this meeting, an Ad Hoc Work Group was formed to assist with alternatives development and participate throughout the process. This group consisted of State, Federal, and County agencies, as well as interest group representatives. The public process is more fully described in Chapter 4, Consultation and Coordination. Chapter 4 also includes a description of the overall public involvement process.

1.8 Summary of Issues

The RMP addresses all activities occurring on Reclamation lands surrounding the reservoir and on the water surface. Reclamation water operations are based on contractual and flood control requirements. Because of these operational constraints, water operations are not part of the RMP. Reclamation identified several issues that need to be addressed by the RMP. These issues were presented to the public, and the list was expanded through this process. A summary list of the primary issues follows.

- Balancing recreation uses with natural and cultural resources, and managing conflicting uses
- Promoting sustainable uses
- Addressing crowding on lands and on the reservoir
- Examining the potential to increase the season of use
- Maintaining, protecting, and managing wildlife and wildlife habitat (including wetlands)
- Restoring natural habitat
- Protecting endangered and sensitive species

- Controlling the spread of noxious weeds
- Examining fisheries issues, such as the fish stocking program
- Protecting water quality
- Controlling and reducing erosion
- Considering impacts to visual resources
- Potentially renaming recreation facilities
- Considering additional recreation facility developments and improvements
- Considering a leash-free zone for pets
- Examining the potential reopening of Recreation Area A East for day use or camping
- Examining trail improvements (such as development of an equestrian trail) and maintenance
- Considering additional concession opportunities
- Improving boating opportunities, including establishing a non-motorized zone, better enforcement of a no-wake zone, and providing a boat ramp for non-motorized craft
- Managing the reservoir fishery, including improvements at boat and bank fishing facilities
- Considering development of the Tualatin Watershed Education and Research Center
- Pursuing additional education & interpretation opportunities
- Managing traffic and parking in the study area
- Improving shoreline access
- Providing facilities for people with disabilities
- Increasing law enforcement in the study area (especially for unauthorized off-road vehicle [ORV] use and hunting)
- Improving trash cleanup, particularly along the shoreline where bank fishing takes place
- Examining the current fee structure
- Examining the timing of special events
- Protecting Cultural Resources
- Protecting Indian sacred sites, if we are informed such are present

2.0 Alternatives

2.0 ALTERNATIVES

This chapter presents the alternatives being considered for implementation of the Henry Hagg Lake RMP. It describes the No Action Alternative and two action alternatives in detail and provides a summary comparison. For each of the alternatives, recreation area improvements are described, such as trails, formal campsites, signage, boat launching facilities, maintenance facilities, and parking improvements. Reclamation does not have the authority, nor does it intend to build all of these facilities independently. Rather, Reclamation would allow these developments to occur if its managing partner (WACO) is involved, cost-share conditions are met, and Reclamation funds are available or other funding sources become available. For comparison of the alternatives, it is assumed that all of the facilities would be built.

2.1 Alternatives Development

NEPA requires Federal agencies to evaluate a range of reasonable alternatives to a proposed Federal action that meet the purpose and need of a proposed action. The NEPA alternatives development process allows Reclamation to work with interested agencies, Tribes, the public, and other stakeholders to develop alternative management plans that respond to identified issues. This Draft EA documents Reclamation's planning and decision-making process for the RMP.

Reclamation began the public involvement process for the Henry Hagg Lake RMP in January 2002 by initiating public scoping. The purpose of this scoping process was to identify issues at Henry Hagg Lake that needed to be included in the RMP alternatives and addressed in the Draft EA. After the first public meeting, held in Hillsboro, Oregon, an Ad Hoc Work Group was formed to address issues and provide input to developing alternatives. The public involvement process is more fully described in Chapter 4, Consultation and Coordination. Reclamation developed the alternatives based on issues identified during the public involvement process, and refined the alternatives with assistance from the Ad Hoc Work Group. The Preferred Alternative was identified during this process for evaluation in this Draft EA.

This process resulted in the development of two action alternatives that prescribe a range of natural, cultural, and recreation resource management actions. A third alternative analyzed in this Draft EA is the No Action Alternative, as required by NEPA. Each alternative would result in different future conditions at the reservoir. The three alternatives are summarized below.

- **Alternative A - No Action - Continuation of Existing Management Practices.** Management would be conducted according to the priorities and projects proposed under the preferred alternative in the 1994 EA for Scoggins Valley Park/Henry Hagg Lake Recreation Development, including camping. Reclamation would continue to adhere to all applicable Federal and State laws, regulations, and executive orders, including those enacted since the 1994 EA was adopted.
- **Alternative B - Minimal Recreation Development with Resource Enhancement.** Alternative B accommodates the increasing demands for recreation at Henry Hagg Lake primarily by expanding and upgrading existing facilities. No camping is proposed under Alternative B. A number of wildlife habitat and vegetation enhancements are included within the alternative.

- **Alternative C - Moderate Recreation Development with Resource Enhancement (Preferred Alternative).** Alternative C proposes the highest level of recreation development among the three alternatives. Provisions of this alternative include allowing for the development of an environmental education & research center, facilitation of camping in a two-phase program, and greater expansion of existing recreation sites. A number of wildlife habitat and enhancement measures also are included under Alternative C.

2.1.1 Similarities Among Alternatives

Although the alternatives differ in many ways, several features are common to all three alternatives:

- Continue to operate and maintain Reclamation lands and facilities.
- Continue to adhere to existing and future Federal, State, and County laws and regulations and executive orders.
- Authorize special recreation events on a case-by-case basis.
- Continue to implement existing restrictions on vehicle use of the shore and drawdown zone.
- Prior to any ground-disturbing action, the appropriate level of site-specific NEPA analysis would be completed. Necessary cultural resources surveys, tribal consultations about traditional cultural properties (TCPs), site evaluation actions, and site protection or mitigation actions would occur when planning new actions. Tribal consultations to identify Indian sacred sites or Indian Trust Assets (ITAs) would also occur as part of planning such actions.
- Continue to follow the principles in Public Law 89-72, Federal Water Projects Recreation Act of 1965, as amended by Title 28 of Public Law 102-575, to share recreation development and fish and wildlife enhancement project costs with WACO.
- WACO continues to manage Reclamation lands under an agreement with Reclamation.
- Weed management through completion and implementation of the Henry Hagg Lake IPM Plan.
- Coordinate with law enforcement entities regarding HR 2925, which authorizes Reclamation to enter agreements with State, Tribal, and local law enforcement agencies to carry out law enforcement on Reclamation land.
- Continue to consult with the Oregon State Historic Preservation Office (SHPO), affected tribes, and other interested parties about cultural resource management actions, consistent with the processes defined for the National Historic Preservation Act (NHPA) in 36 CFR 800.
- Compliance with current accessibility regulations and standards required at all new facilities and on retrofits of existing facilities.
- Implementation of an elk habitat management plan.

- All actions are dependent upon the availability of funding and must be within the authority of the applicable agency.

2.2 Alternatives Considered in Detail

Three alternatives were selected for detailed analysis. A narrative highlights the primary elements of each alternative, and Table 2.2-1 summarizes each alternative. The impacts of each alternative are described in Chapter 3, Affected Environment and Environmental Consequences.

Alternative plans are defined by different choices to address future management of the study area. These draft alternatives are an important part of the planning process because they allow for a thorough exploration of a range of different options and an analysis of the potential environmental impacts that may result from their implementation.

Analysis of the No Action Alternative is required under NEPA. For the purposes of managing this area and analysis in the EA, the No Action Alternative (Alternative A) represents the continuation of management under the preferred alternative of the 1994 EA. Two action alternatives have been built around the following themes: (1) Alternative B - Minimal Recreation Development with Resource Enhancement; and (2) Alternative C - Moderate Recreation Development with Resource Enhancement. Alternative C has been identified as the Preferred Alternative.

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/}

Area and Topic	Alternative A-No Action ^{2/} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
TOPICS APPLICABLE TO THE ENTIRE AREA			
Overall Wildlife and Vegetation Management	Develop native vegetation buffers at developed areas and monitor impacts from recreation use.	<p>Install bird/bat boxes where appropriate.</p> <p>Plant woody species in riparian zones, specifically - Tanner and Scoggins Creeks.</p> <p>Maintain buffer zones adjacent to recreation sites.</p> <p>*Install cofferdam at Tanner Creek Cove to enhance wetlands.</p>	<p>Same as Alternative B, plus:</p> <p>Install cofferdam at Nelson Cove to enhance wetlands as part of the education & research center and tied to additional studies for feasibility.</p>
Elk Meadows	<p>No development proposed in elk meadows, set aside for wildlife values.</p> <p>Develop long-term management plan for rehabilitation and maintenance of elk meadows (approximately 140 acres total).</p>	<p>RMP to include long-term management plan for the rehabilitation and maintenance and monitoring of elk meadows (i.e., specific actions for each site). Main objectives to: enlarge, rehabilitate, and maintain a minimum of 140 acres of elk meadows.</p> <p>Maintain elk meadows with vegetative buffer between the meadows and reservoir to protect water quality.</p> <p>Allow disc golf at Sain Creek meadow, including gravel parking lot for 8 cars, with a seasonal closure consistent with park operating season.</p> <p>Mitigate for any impacts to elk habitat from future development, as needed.</p> <p>Using monitoring data, work with ODFW to evaluate the need for elk meadows over the course of the next 10 years.</p>	Same as Alternative B.
Noxious Weeds	Develop and implement an Integrated Pest Management Plan.	Same as Alternative A.	Same as Alternative A.

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/}

Area and Topic	Alternative A-No Action ^{2/} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
TOPICS APPLICABLE TO THE ENTIRE AREA (CONT.)			
Rare, Threatened, and Endangered Species	<p>Comply with Federal Endangered Species Act regarding all pertinent activities.</p> <p>Construction and necessary tree removal limited to between March 31 and October 31 to protect wintering eagles.</p> <p>Protect eagle perch sites around reservoir.</p>	<p>Same as Alternative A plus:</p> <p>Cooperate with USFWS to monitor eagle use on Reclamation land and water.</p>	<p>Same as Alternative B.</p>
Fisheries Management	<p>Continued management of fisheries in reservoir by ODFW.</p> <p>Provide mitigation for installation of floating docks and their effect to fish habitat.</p>	<p>Same as Alternative A, plus:</p> <p>Cooperate with ODFW and fishing clubs on habitat enhancement projects.</p>	<p>Same as Alternative B.</p>
Water Quality & Erosion and Sedimentation Control	<p>Provide erosion control for construction-related activities.</p> <p>Provide appropriate drainage control at parking lots and add garbage cans.</p>	<p>Same as Alternative A, plus:</p> <p>Coordinate w/ applicable agencies to install woody debris in place of portions of diversion dams where appropriate.</p> <p>Coordinate with applicable agencies on sediment and erosion control projects upstream of Reclamation lands.</p> <p>Continue to cooperate with CWS and TVID water quality sampling efforts.</p>	<p>Same as Alternative B, plus:</p> <p>Add a floating restroom near buoy line.</p>

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/}

Area and Topic	Alternative A-No Action ^{2/} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
TOPICS APPLICABLE TO THE ENTIRE AREA (cont.)			
Cultural Resources General	Comply with Sections 106 and 110 of NHPA, ARPA, and NAGPRA. Use consultative processes defined in 36 CFR 800 to determine if sites are eligible to the National Register of Historic Places (National Register), assess project effects, and identify preservation or mitigation actions. Use processes defined in 45 CFR 10 if human remains are discovered that are of Indian origin.	Same as Alternative A.	Same as Alternative A.
Identification & Evaluation	<p>Complete archeological surveys when ground-disturbing actions are proposed in locations where no survey that meets today's professional standards has been previously performed. This determination will be made by a Reclamation archeologist. Complete test excavations or other site evaluation actions at archeological sites found in areas of new ground disturbance or at other recorded sites if they appear threatened by land use or project operations.</p> <p>Complete Tribal consultations as necessary to determine if traditional cultural properties (TCPs) are present in areas of new ground-disturbing actions, or are in or near focused use areas. If TCPs are present, assess impacts on National Register eligible TCPs from proposed new actions or from existing use.</p> <p>Reclamation will complete research to determine if site 02/801-3 is eligible to the National Register.</p>	Same as Alternative A.	Same as Alternative A.

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/}

Area and Topic	Alternative A-No Action ^{2/} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
TOPICS APPLICABLE TO THE ENTIRE AREA (cont.)			
Protection	<p>Unless justified, develop no new features or implement no new ground-disturbing actions within the boundaries of a National Register-eligible site or TCP. If a decision were made to proceed with a damaging action, design the facilities to avoid or minimize resource damage.</p> <p>Monitor National Register-eligible or unevaluated sites or TCPs in or near focused use areas to allow early detection of damage, in the event such sites are recorded in the future.</p> <p>Implement management actions or mitigation actions to address identified adverse effects on National Register-eligible sites or TCPs. Implement actions at site 02/801-3, if needed.</p> <p>In the event of discovery of human remains of Indian origin, complete protective actions, Tribal notification, and consultation procedures as required by 45 CFR 10. Consult potentially affiliated Tribes about procedures for protection, treatment, and disposition. Human remains would be left in place, unless it were determined they could not be protected from harm.</p> <p>In the event that future actions generate archeological collections, curate those collections using processes consistent with 36 CFR 79 and 411 DM, which define Federal requirements.</p>	<p>Same as Alternative A plus:</p> <p>Work with local partners to provide educational information about resource value and interpretive information about area prehistory and history.</p>	Same as Alternative B.

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/}

Area and Topic	Alternative A-No Action ^{2/} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
TOPICS APPLICABLE TO THE ENTIRE AREA (cont.)			
Indian Sacred Sites	Comply with Executive Order (EO) 13007, Indian Sacred Sites, for any new undertakings. Complete Tribal consultations to determine if sacred sites are present in areas of new ground-disturbing actions. Seek to avoid damages and maintain access when implementing new undertakings, when protective actions are consistent with accomplishing the agency mission and with law.	Same as Alternative A, plus: If existing public land uses are found to damage sacred sites, seek to resolve impact in a manner that preserves public land use while maintaining access.	Same as Alternative B.
Indian Trust Assets	Consult on actions that may affect ITAs and seek to avoid impacts.	Same as Alternative A.	Same as Alternative A.
Scenic Values	Design new facilities to be compatible with scenic values. Use native plants for landscaping. Buffer views of new parking areas from road using plantings. Restore viewsheds through selective vegetation thinning.	Same as Alternative A.	Design new facilities to be compatible with scenic values. Use native plants for landscaping. Restore viewsheds through selective vegetation thinning.
Safety and Emergency Services	Continue emergency service agreements with Oregon Department of Forestry and Gaston Rural Fire Department. Coordinate agency input to review proposed facilities and campground regarding safety and emergency services access. Provide 24-hour staff presence at	Continue emergency service agreements with Oregon Department of Forestry and Gaston Rural Fire Department. Coordinate agency input to review proposed facilities and campground regarding safety and emergency services access.	Same as Alternative A.

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/}

Area and Topic	Alternative A-No Action ^{2/} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
	proposed campground.	Maintain clear and open view corridors between the perimeter road and parking areas for law enforcement/ monitoring.	
TOPICS APPLICABLE TO THE ENTIRE AREA (cont.)			
Enforcement	Park rangers to continue to provide enforcement. Continue to coordinate with Washington County Sheriff's Department, Oregon State Police, and Coast Guard Auxiliary.	Same as Alternative A, plus: Maintain adequate enforcement commensurate with levels of public use.	Same as Alternative B.
Special Events	Continue to comply with WACO's Scoggins Valley Park reservation application system, including current policies and fees for special use.	Same as Alternative A.	Same as Alternative A.
Public Information	Continue Washington County information program that includes: <ul style="list-style-type: none"> • Web site • Brochures • Bulletin boards • Special event notices • County newsletter • Press releases • Neighborhood newsletter • Park Advisory Board meetings • Outreach program 	Same as Alternative A, plus: Develop interpretative program to highlight: <ul style="list-style-type: none"> • Natural history • Reclamation Project history • Surrounding Forest Practices • Pre-history & history 	Same as Alternative B.

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/1}

Area and Topic	Alternative A-No Action ^{1/2} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
TOPICS APPLICABLE TO SPECIFIC SHORESIDE AREAS			
RMP Implementation	No Actions identified.	<p>Establish, maintain, and annually update a planning schedule and list of priority actions.</p> <p>Until a decision is made regarding raising the dam, focus RMP implementation on critical operation, maintenance, and capacity accommodation (where feasible), and avoid high cost capital improvement projects.</p> <p>Seek joint funding opportunities to implement RMP actions.</p> <p>Keep stakeholders, surrounding landowners, and the public informed of RMP implementation status.</p>	Same as Alternative B.
Reclamation Zone (operation and maintenance area around the dam)	No actions identified.	<p>Recreation use to be conditionally permitted within the Reclamation Zone; however, during low water this area may be closed for safety reasons.</p> <p>Show and describe Reclamation Zone on publicly distributed materials.</p>	Same as Alternative B.
Fee Station and Entry Road	No additions or changes to existing facility.	Same as Alternative A.	If feasible and justified due to security concerns and carrying capacity limitations, work with Washington County Commissioners, Land Use & Transportation Department, and neighboring landowners to implement a limited access plan whereby park traffic is required to access the area through the fee station and local traffic is afforded a separate, gated access.
Park Administrative Office & Maintenance Yard	No actions identified.	Construct an addition to the existing vehicle storage shed (60'x 26') for equipment and vehicle storage.	Same as Alternative B.

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/1}

Area and Topic	Alternative A-No Action ^{2/} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
TOPICS APPLICABLE TO SPECIFIC SHORESIDE AREAS (cont.)			
Recreation Area A East	Add the following to the existing facilities: <ul style="list-style-type: none"> • Showers in existing buildings • One group picnic area • One play structure • 70 campsites (30 tent walk-in, 40 drive-in or RV sites) • 15-unit group camp • 40-slip boat dock • RV dump site Limit camping to between Apr 1 - Oct 31.	Re-open as day use area and add: <ul style="list-style-type: none"> • Play structure • Group shelter 	Open the area for camping under a two-phased program as follows (with phase one as a pilot program to test the overall success of opening the area for camping): <p><u>Phase One</u></p> <ul style="list-style-type: none"> • Camp host site • Showers in existing buildings • One group picnic area • 50 campsites (tent sites) • Increased security <p><u>*Phase Two</u></p> <ul style="list-style-type: none"> • Group shelter • One play structure • 50 campsites (RV sites) • 15-unit group camp area • RV dump site • 40-slip boat dock Limit camping to between April 1 – Labor Day.
Boat Ramp/Recreation Area A West	Add the following to the existing facilities: <ul style="list-style-type: none"> • Pave, add curbs, striping, and arrows (as needed) to the existing 17,000 sf gravel parking area. • Group picnic shelter • One restroom 	Add the following to the existing facilities: <ul style="list-style-type: none"> • Self-adjusting pier (replacement of existing boat floats) • Fish-cleaning station • Designate concession area • Boat dump facility 	*Same as Alternative B, plus: <ul style="list-style-type: none"> • New picnic shelter • Play structure • Permanent concession facility • Expanded parking for 30 vehicles/trailers and 20 cars
Access and Trails Hiking and Biking	Develop connections to existing Master (shoreline) Trail – multiple use, bike and pedestrian, 15 miles long. Perimeter road – 10.5 mile long.	Same as Alternative A.	Same as Alternative A, plus: <ul style="list-style-type: none"> • *Where feasible, widen the road shoulder from 7' to 10' and sign/stripe for bicycles, pedestrians, and overflow parking. • *Fully develop the Master (shoreline) Trail to route entire trail off the paved road.

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/}

Area and Topic	Alternative A-No Action ^{2/} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
TOPICS APPLICABLE TO SPECIFIC SHORESIDE AREAS (cont.)			
Equestrian	No trail proposed.	Same as Alternative A.	Allow for development of a new, independent equestrian trail to be constructed and maintained by equestrian groups on the upper side of the perimeter road; include an accessible staging/parking area with sanitation facilities for up to 25 users.
Nelson Cove – Tualatin Watershed Education & Research Center	Maintain existing elk meadow with no recreation development.	Same as Alternative A.	Authorize development of education & research center as fully proposed, including: <ul style="list-style-type: none"> • Outdoor School • Portland State University Field Research Station • Community Center for neighboring landowners.
Scoggins Creek Picnic Area	Add to existing facilities: <ul style="list-style-type: none"> • New groundwater supply • Permanent vault restroom facility • Six picnic tables • One sheltered group picnic site Pave parking lot.	Add to existing facilities: <ul style="list-style-type: none"> • Permanent vault restroom facility • Boardwalk and interpretive signs 	Same as Alternative A, plus: <ul style="list-style-type: none"> • *Play structure • *Boardwalk and interpretive signs
Boat Ramp/Recreation Area C	Add to existing facilities: <ul style="list-style-type: none"> • One sheltered group picnic area. • One restroom • One play structure • One permanent concession facility (approximately 400 sq. ft.) • 245 car parking 	Same as Alternative A, plus: <ul style="list-style-type: none"> • Self-adjusting pier (replacement of existing boat floats) • Fish-cleaning station But without: <ul style="list-style-type: none"> • Play structure • Permanent concession 	Same as Alternative A, plus: <ul style="list-style-type: none"> • *Self-adjusting pier (replacement of existing boat floats) • *Fish-cleaning station

Table 2.2-1. Henry Hagg Lake Resource Management Plan – Draft EA Alternatives.^{1/1}

Area and Topic	Alternative A-No Action ^{1/2/} – Continuation of Existing Management Practices	Alternative B – Minimal Recreation Development with Resource Enhancement	Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)
TOPICS APPLICABLE TO SPECIFIC SHORESIDE AREAS (cont.)			
Recreation Area C Extension (Cove Area)	Add to existing facilities: <ul style="list-style-type: none"> • Extend potable water from Recreation Area C • One restroom building • 20 picnic tables • One sheltered group picnic area • Parking area adjacent to road (129 parking spaces) 	No development proposed.	Allow for the development of facilities according to the following two-phased approach: <u>Phase One</u> <ul style="list-style-type: none"> • Recondition existing parking area and turn around with 35 marked parking spaces, curbs, and entry and exit ways • Install accessible pathway to waters edge • Install non-motorized (kayak, canoe, etc.) boat launch <u>*Phase Two</u> <ul style="list-style-type: none"> • Expand parking area from 35 to 70 parking spaces • Add roadway from Cove entrance to connect with parking/roadway system at Recreation Area C Boat Ramp • Add 8 accessible parking slots in proximity to accessible fishing pier • Add accessible restroom between new accessible parking area and accessible fishing pier
Sain Creek Picnic Area	Add to existing facilities: <ul style="list-style-type: none"> • One play structure. 	No change from existing facilities.	Same as Alternative A.
Elks Picnic Area	Enhance existing facilities by paving the parking area.	No change from existing facilities.	Same as Alternative A.

Notes:

^{1/1} All new and remodeled facilities will be designed and constructed in accordance with current standards for accessibility for persons with disabilities.^{1/2} Alternative A is the No Action Alternative as required under NEPA. In this case, if implemented, it would mean continuing to manage the RMP study area under the 1994 Recreation Management Plan and follow current Federal regulations. It is important to note that Alternative A is not necessarily a "status quo" situation. Rather, Alternative A would be a continuation of the existing 1994 Plan whereby actions called for in that plan would could continue to be implemented, dependent on funding, coordination, and willing partners.

* Status, timing, and location of implementation dependent on dam raise. See Section 1.6 for a detailed discussion.



Back of Figure 2.2-1

2.2.1 Alternative A – No Action Alternative

Under the No Action Alternative, management would continue to be guided by the preferred alternative as outlined in the 1994 EA for Scoggins Valley Park/Henry Hagg Lake (Figure 2.2-1). Reclamation's support and funding would continue to be directed by the guidelines of the 1994 EA, which may or may not meet current and future demand or facility needs. Issues and concerns not previously addressed or included in the 1994 EA would be dealt with on an ad hoc basis. Recreation development is generally greater than that of Alternative B but less than that of Alternative C. Under the No Action Alternative, it is assumed that the portions of the 1994 EA that have not been implemented, such as providing for camping at Recreation Area A East, would be completed. Specifics of Alternative A are discussed below.

2.2.1.1 Topics Applicable to the Entire Area

Overall Wildlife and Vegetation Management

The 1994 EA stipulated that native vegetation buffers would be developed between recreation sites and natural areas for wildlife enhancement. These buffers have not been implemented to date. These buffers would be monitored for impacts from recreation use.

Elk Meadows

No development would occur in any of the designated elk meadows along the perimeter of the reservoir. In addition, a long-term management plan would be developed for the rehabilitation and maintenance of the elk meadows (total 140 acres). See Section 3.5 for a detailed discussion of the elk meadows.

Noxious Weeds

The IPM Plan will be prepared by Reclamation and will prescribe specific technical measures and strategies for weed control. Implementation of the IPM Plan would be done by the managing partners, WACO and TVID. A separate NEPA process will be conducted for this plan.

Rare, Threatened, and Endangered Species

Reclamation would continue to comply with the Federal Endangered Species Act (ESA) regarding all activities at Henry Hagg Lake. Construction and necessary tree removal would be limited to between March 31 and October 31 for the protection of wintering bald eagles. In addition, identified eagle perch trees around the reservoir would be protected.

Fisheries Management

Reclamation would continue to coordinate on the management of fisheries resources with the Oregon Department of Fish and Wildlife (ODFW). Mitigation would be provided for the installation of any floating docks and the subsequent effect to fish habitat.

Water Quality and Erosion and Sedimentation Control

Erosion control would be provided for all construction-related activities. Appropriate drainage control would be provided at parking lots. Garbage receptacles would be added where necessary for improved collection.

Cultural Resources

General

Reclamation would comply with requirements of Sections 106 and 110 of the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), and the Native American Graves Protection and Repatriation Act (NAGPRA). Reclamation would use consultative processes defined in 36 CFR 800 to determine if sites are eligible to the National Register of Historic Places (National Register), assess project effects, and identify preservation or mitigation actions. Reclamation would use processes defined in 45 CFR 10 if human remains are discovered that are of Indian origin.

Identification & Evaluation

Reclamation will complete research to determine if site 02/801-3 is eligible to the National Register. Reclamation would complete archeological surveys when ground-disturbing actions are proposed in locations where no survey that meets today's professional standards has been previously performed. This determination will be made by a Reclamation archeologist. Reclamation would complete test excavations or other site evaluation actions at archeological sites found in areas of new ground disturbance or at other recorded sites if they appear threatened by land use or project operations.

Reclamation would complete Tribal consultations as necessary to determine if TCPs are present in areas of new ground-disturbing actions, or are in or near focused use areas. If TCPs are present, Reclamation would assess impacts on National Register eligible TCPs from proposed new actions or from existing use.

Protection

Unless justified, Reclamation would develop no new features or implement no new ground-disturbing actions within the boundaries of a National Register-eligible site or TCP. If a decision were made to proceed with a damaging action, design the facilities to avoid or minimize resource damage.

Reclamation would monitor National Register-eligible or unevaluated sites or TCPs in or near focused use areas to allow early detection of damage, in the event such sites are recorded in the future.

Reclamation would implement management or mitigation actions to address identified adverse effects on National Register-eligible sites or TCPs. If site 02/801-3 is found to be eligible, then Reclamation will assess the impacts to the site from use and maintenance of the shoreline Master Trail, and then identify and implement actions to either avoid further impacts or mitigate ongoing impacts.

In the event of discovery of human remains of Indian origin, Reclamation would complete protective actions, Tribal notification, and consultation procedures as required by 45 CFR 10. Consult potentially

affiliated Tribes about procedures for protection, treatment, and disposition. Human remains would be left in place, unless it were determined they could not be protected from harm.

In the event that future actions generate archeological collections, Reclamation would curate those collections using processes consistent with 36 CFR 79 and 411 DM, which define Federal requirements.

Indian Sacred Sites

Reclamation would comply with Executive Order (EO) 13007, Indian Sacred Sites, for any new undertakings. Complete Tribal consultations to determine if sacred sites are present in areas of new ground-disturbing actions. Reclamation would seek to avoid damages and maintain access when implementing new undertakings, when protective actions are consistent with accomplishing the agency mission and with law.

Indian Trust Assets

Reclamation would consult on actions that may affect ITAs and avoid impacts.

Scenic Values

All new facilities would be designed to be compatible with existing scenic values. Native plants would be used for landscaping and views of parking lots from the perimeter road would be buffered with vegetation. In addition, viewsheds would be restored by selective brush clearing.

Safety and Emergency Services

Emergency services agreements with the Oregon Department of Forestry (ODF) and the Gaston Rural Fire Department (GRFD) would continue. Reclamation would coordinate review of any proposed facilities with the appropriate safety and emergency service agencies regarding access. In addition, park and/or volunteer staff would be present on a 24-hour basis at the proposed campground at Recreation Area A East.

Enforcement

Park rangers would continue to provide enforcement of park regulations and would continue to coordinate with State Police, County Sheriff's Department, and the U.S. Coast Guard Auxiliary.

Special Events

Reclamation would continue to comply with WACO's Scoggins Valley Park reservation system, including the fee structure and general policies.

Public Information

WACO would continue its public outreach program using a variety of media.

RMP Implementation

No actions were identified in the 1994 EA under this heading.

Reclamation Zone

No actions were identified for this zone around the dam (Figure 2.2-1) in the 1994 EA under this heading.

2.2.1.2 Topics Applicable to Specific Shoreside Areas

Fee Station and Entry

No changes were proposed to the existing facility.

Park Administrative Office and Maintenance Yard

No changes were proposed to the existing facility.

Recreation Area A East

A number of improvements were proposed for this area to accommodate camping. Features such as showers, designated campsites for tents and recreation vehicles (RVs), a boat dock, picnic area, play structure, and an RV dump are included. Camping was never instituted at Recreation Area A East. Camping that would be instituted under this alternative would be limited to between April 1 and October 31.

Recreation Area A West

New paving, curbs, striping, and road arrows would be added to the existing parking lot. Other added features include a group picnic area and a new restroom.

Access and Trails

Connections would be developed to the existing shoreline trail, but no equestrian trail use is proposed.

Nelson Cove – Tualatin Watershed Education & Research Center

No measures are proposed under this heading in the 1994 EA.

Scoggins Creek Picnic Area

A number of existing facilities would be added to the site including a new groundwater supply, a permanent vault restroom, six picnic tables, and one sheltered group picnic site; in addition, the parking lot would be paved.

Recreation Area C

A number of facilities would be added to the day use area including a sheltered picnic area, parking for 245 cars, one restroom, a play structure, and a permanent concession facility.

Recreation Area C Extension (Cove Area)

Facilities that would be added include extension of potable water from the adjacent Recreation Area C, one restroom, 20 picnic tables, a sheltered picnic area, and parking for 129 cars.

Sain Creek Picnic Area

The addition of one play structure is proposed for this site.

Elks Picnic Area

The existing parking lot would be paved.

2.2.2 Alternative B – Minimal Recreation Development with Resource Enhancement

Alternative B provides for minimal recreation development with enhancement of natural resources on Reclamation land (Figure 2.2-2). While adding to the existing recreation facilities, Alternative B also provides for a number of resource enhancements for wildlife habitat and wetlands. A primary component that differs from Alternatives A and C is that Alternative B would facilitate day use at Recreation Area A East while the other two alternatives would accommodate camping. Increased capacity would be implemented through expansion of existing facilities. For instance, unlike the other two alternatives, no development is proposed at the Recreation Area C Extension area. Modifications to existing facilities are generally less than or similar to those proposed under Alternative A, and are generally less intensive than those under Alternative C.

2.2.2.1 Topics Applicable to the Entire Area

Overall Wildlife and Vegetation and Management

A number of wildlife and vegetation enhancements are proposed, including: installing bird/bat boxes where appropriate, planting woody species in the riparian zones of Tanner and Scoggins Creeks, maintaining buffer zones adjacent to recreation sites, and installing a cofferdam at Tanner Creek Cove to enhance wetlands. Installation of any wetland enhancement projects would depend on the timing and final decision regarding the potential dam raise.

Elk Meadows

Under Alternative B, the RMP would include a long-term plan to rehabilitate and maintain the elk meadows with the goal to maintain 140 acres. Buffers would be maintained between the meadows and the reservoir to protect water quality. A disc golf course would be installed at the Sain Creek meadow with seasonal closures consistent with the park operating season to protect against disturbing elk use. Reclamation would work with ODFW on a monitoring plan to evaluate elk use of the meadows over the next 10 years. Any impacts to elk meadows in the future would be appropriately mitigated.

Noxious Weeds

Reclamation would develop and implement an IPM Plan for Henry Hagg Lake.

Rare, Threatened, and Endangered Species

Alternative B would incorporate the measures described under Alternative A and also calls for cooperation with the U.S. Fish and Wildlife Service (USFWS) to monitor eagle use on Reclamation lands and water.

Fisheries Management

Alternative B would incorporate the measures described in Alternative A. In addition, Reclamation would cooperate with ODFW and fishing clubs on appropriate habitat enhancement projects.

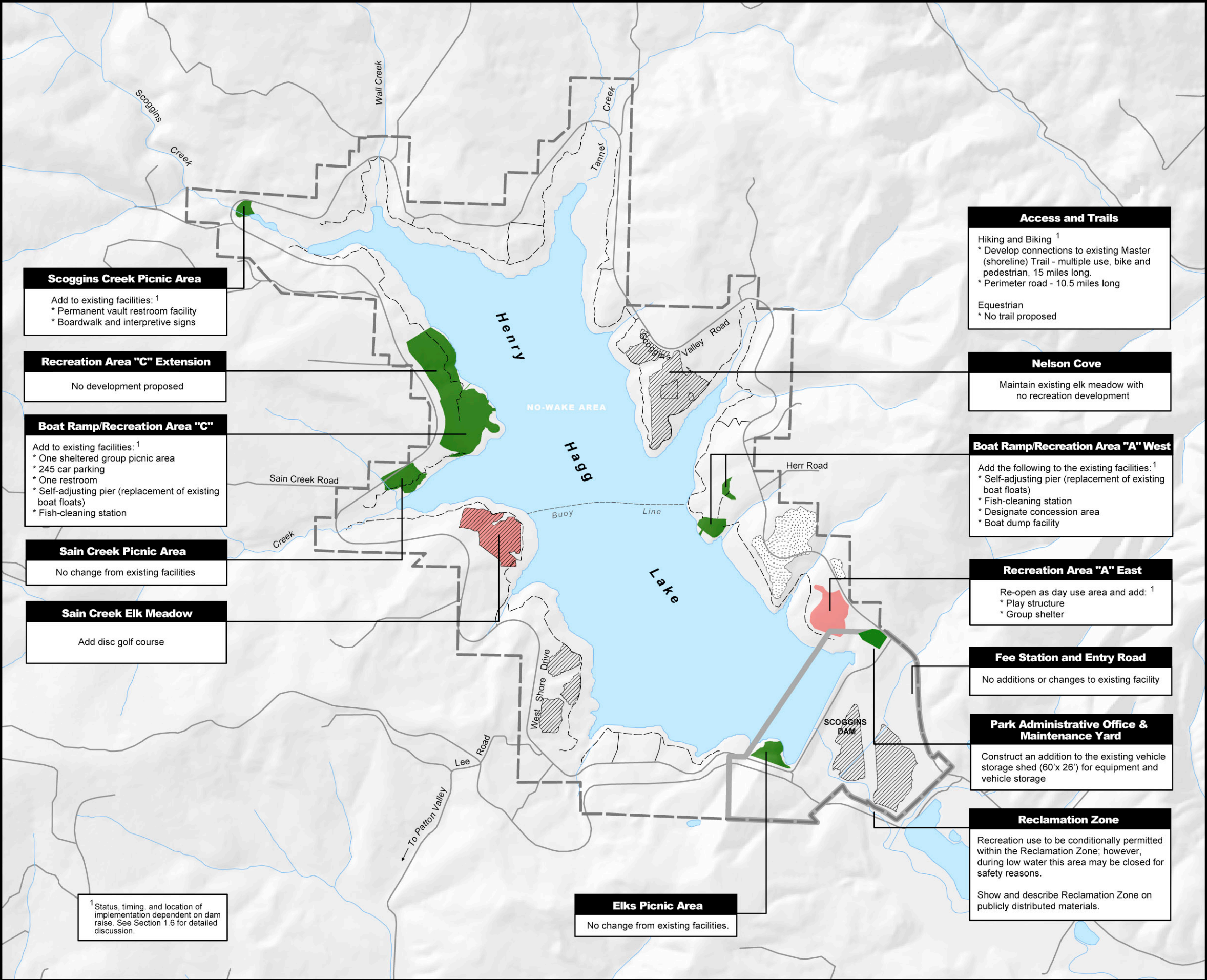
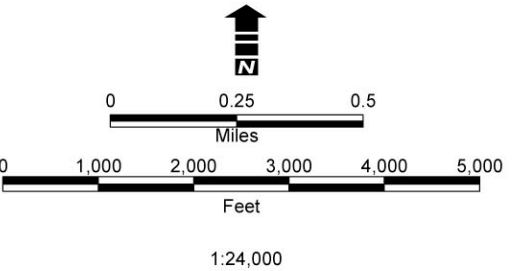


Figure 2.2-2
Alternative B: Minimal Recreation
Development with Resource
Enhancement

- Park Facility or Recreation Site
- Proposed New Use
- Existing Elk Meadow
- Future Elk Meadow
- Reclamation Zone
- Reclamation Lands
- Recreation Trail
- Recreation Trail Access
- Road
- Stream



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Water Quality and Erosion and Sedimentation Control

In addition to the measures described under Alternative A, Alternative B would include coordination with applicable agencies to install woody debris in streams where appropriate, coordinate with agencies on sediment and erosion control projects upstream of Reclamation lands, and continue coordination with CWS and TVID on water quality monitoring.

Cultural Resources

Measures under Alternative B would be the same as for Alternative A, except they would also include provisions for working with local partners to provide educational information regarding the area's prehistory and history.

Indian Sacred Sites

Measures under Alternative B for Indian sacred sites would be the same as those under Alternative A and would resolve any impacts to Indian sacred sites while maintaining public access.

ITAs

Measures under Alternative B for ITAs would be the same as those under Alternative A.

Scenic Values

Provisions for maintaining the visual qualities of the area are the same as those described under Alternative A.

Safety and Emergency Services

Alternative B would continue the emergency services agreements with ODF and GRFD, coordinate agency input to review safety and emergency services access with appropriate agencies, and maintain clear and open view corridors between the perimeter road and parking areas for enforcement and monitoring.

Enforcement

Alternative B would include the measures described under Alternative A but also would maintain adequate enforcement commensurate with levels of public use.

Special Events

Actions under Alternative B would be the same as those described under Alternative A.

Public Information

In addition to the measures described under Alternative A, Alternative B would include the development of an interpretative program for natural history, Reclamation Project history, surrounding forest practices, and the general pre-history and history of the area.

RMP Implementation

Alternative B would include provisions to establish an annual planning schedule and priority list, focus RMP implementation to avoid high capital cost improvements until a decision regarding the dam raise is made, seek joint funding opportunities, and keep the public informed of RMP implementation status.

Reclamation Zone

Recreation use of the Reclamation Zone would be conditionally permitted, but it may be closed during low water periods. The Reclamation Zone would be indicated on publicly distributed materials.

2.2.2.2 Topics Applicable to Specific Shoreside Areas

Fee Station and Entry Road

Measures would be the same as those described under Alternative A.

Park Administrative Office and Maintenance Yard

An additional vehicle storage shed (60 x 40 ft) would be constructed.

Recreation Area A East

This site would be re-opened as a day use area only with the inclusion of a play structure and a group shelter.

Recreation Area A West

Improvements to the existing facilities would include a self-adjusting pier to replace the existing boat floats, a fish cleaning station, a concession area, and a boat dump facility.

Access and Trails

Measures under Alternative B would be the same as those described under Alternative A.

Nelson Cove – Tualatin Watershed Education & Research Center

Measures under Alternative B would be the same as those described under Alternative A.

Scoggins Creek Picnic Area

A permanent vault restroom and a boardwalk with interpretive signs would be added to the day use area.

Recreation Area C

Improvements would include the addition of a sheltered group picnic area, parking for 245 cars, a restroom, a self-adjusting pier, and a fish cleaning station.

Recreation Area C Extension

No development is proposed at this site under Alternative B.

Sain Creek Picnic Area

No changes to the existing facilities are proposed.

Elks Picnic Area

No changes to the existing facilities are proposed.

2.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement – Preferred Alternative

Alternative C includes a generally higher level of recreation development than the other two alternatives and includes the proposed environmental education & research center and new facilities at the Recreation Area C Extension (Figure 2.2-3). This alternative also incorporates provisions for fish and wildlife enhancement, improvements and monitoring of elk meadows, and use of native plants for landscaping. Similar to Alternative B, increased capacity is addressed by expansion of existing facilities, but to a greater degree. In addition, a phased implementation of camping at Recreation Area A East is proposed. This alternative will consider the potential development of an independent equestrian trail to be constructed and maintained by equestrian groups to include a staging/parking area with sanitation facilities and parking for up to 25 vehicles/users.

2.2.3.1 Topics Applicable to the Entire Area

Overall Wildlife and Vegetation Management

In addition to the measures described under Alternative B, an additional cofferdam is proposed for Nelson Cove for wetland enhancement associated with the development of the environmental education & research center.

Elk Meadows

Measures for Alternative C would be the same for those described under Alternative B.

Noxious Weeds

Measures for Alternative C would be the same as those described under Alternative B.

Rare, Threatened, and Endangered Species

Measures for Alternative C would be the same as those described under Alternative B.

Fisheries Management

Measures for Alternative C would be the same as those described under Alternative B.

Water Quality and Erosion and Sedimentation Control

In addition to the measures described under Alternative A, a floating restroom would be added near the reservoir buoy line.

Cultural Resources

Measures for cultural resources under Alternative C would be the same as those described under Alternative B.



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Indian Sacred Sites

Measures for Indian Sacred sites under Alternative C would be the same as those described under Alternative B.

ITAs

Measures for ITAs would be the same as those described under Alternative B.

Scenic Values

Facilities would be designed for compatibility with scenic values, native plants would be used for landscaping, and viewsheds would be restored using selective vegetation thinning.

Safety and Emergency Services

Measures for Alternative C would be the same as those described under Alternative A.

Enforcement

Measures for Alternative C would be the same as those described under Alternative B.

Special Events

Measures for Alternative C would be the same as those described under Alternative B.

Public Information

Measures for Alternative C would be the same as those described under Alternative B. In addition, the proposed outdoor education center will have a public information component.

RMP Implementation

Measures for Alternative C would be the same as those described under Alternative B.

Reclamation Zone

Measures for Alternative C would be the same as those described under Alternative B.

2.2.3.2 Topics Applicable to Specific Shoreside Areas

Fee Station and Entry Road

If feasible and justified due to security concerns and carrying capacity limitations, Reclamation would coordinate with the Washington County Commissioners, Land Use and Transportation Department, and neighboring landowners to implement a limited access plan. Park traffic would be required to access the area through the fee station, and local traffic would be provided a separate, gated access. This would require a gate across Scoggins Valley Road that leads into the park.

Park Administrative Office and Maintenance Yard

Measures for Alternative C would be the same as those described under Alternative B.

Recreation Area A East

Camping would be accommodated under a two-phase program. Phase one would be implemented as a pilot program to test the overall success of introducing camping in the park. Phase one would only accommodate tent camping (50 sites), while phase two would include a group camp and sites for RVs (50 sites).

Recreation Area A West

In addition to the measures proposed under Alternative B, Alternative C would include a new picnic shelter, a play structure, permanent concession facility, and expanded parking for 30 vehicles/trailers and 20 cars.

Access and Trails

Alternative C includes the measures proposed under Alternative A plus provisions for widening the road shoulder where possible for bicycles, improving the shoreline trail so it is entirely off of the perimeter road, and allowing a separate equestrian trail to be developed by equestrian groups.

Nelson Cove – Tualatin Watershed Education & Research Center

Reclamation, WACO, the Northwest Regional Education Service District, and Portland State University (PSU) have been cooperating on the potential design of a facility at Henry Hagg Lake for the Northwest Outdoor Science School and Center for Lakes and Reservoirs. The facility would include:

- Fully equipped classrooms for elementary and high school age students and field laboratories for college studies;
- A large lecture hall;
- A dining hall serving up to 230 people during meals and events;
- Overnight lodging for 140 elementary students and 48 counselors in cabins, and accommodations for 25 staff and teachers;
- A boathouse and dock for study excursions to the reservoir and nearby wetlands;
- An outdoor study area with artificial streams and ponds for research; and
- A covered campfire facility, amphitheater, outdoor learning shelters, and pathways.

A feasibility study was finalized on May 21, 2001 (WACO 2001) and provides an overview of the facilities, estimates of costs, documentation of the public input process, facility design options, and a site analysis. The preferred site for the facility is located in the Nelson Cove elk meadow on the east shore of the reservoir. The facility would fully incorporate sustainable development elements and would be designed and positioned in a manner that was the least intrusive to the area's scenic qualities. The

feasibility study was an initial step for this facility, and along with potential environmental impacts being considered under this EA, land status, and wildlife mitigation requirements will also guide Reclamation's decision process for this proposal.

Scoggins Creek Picnic Area

In addition to the measures proposed under Alternative A, Alternative C would include a play structure and a boardwalk with interpretive signs.

Recreation Area C

In addition to the measures proposed under Alternative A, a self-adjusting pier and a fish cleaning station would be developed.

Recreation Area C Extension

Facilities would be developed under a two-phase approach. Under the initial phase, the existing parking lot would be reconditioned (new paving, add parking stripes, curbs, and entry-exit ways), an accessible pathway would be developed to the water, and a non-motorized boat launch would be constructed. Phase two would include the expansion of the parking lot, addition of a road connection to C ramp, addition of eight accessible parking slots, and addition of an accessible restroom.

Sain Creek Picnic Area

Measures for Alternative C would be the same as those described under Alternative A.

Elks Picnic Area

Measures for Alternative C would be the same as those described under Alternative A.

2.3 Alternative Elements Eliminated from Consideration

Most of the elements suggested by the public were included in one or more of the action alternatives. Some elements that were suggested included construction of a combined equestrian trail (i.e., part of existing shoreline trail), designating a portion of the reservoir for non-motorized boats, designation of a “wildlife refuge area” on the reservoir, specific riparian and fish habitat enhancements, and designation of an off-leash area for pets. These elements were reviewed, discussed, and analyzed among the Ad Hoc Work Group members and the Reclamation RMP Team members but were eliminated from further consideration because of potential costs, high potential for conflict with natural resources, conflicts between users, and standard Reclamation policies.

Henry Hagg Lake is close to a large metropolitan population; this, combined with the current high level of use by motorized boats, made designation of a non-motorized portion of the reservoir likely to lead to user conflicts and safety concerns. Waterfowl use of the reservoir is greatest during the period when the recreation facilities are closed, from November through March. Migrating and wintering waterfowl use the reservoir as resting habitat during this time when the pool level is rising or stable. Because of the different seasons of use between humans and waterfowl and the high recreation demand, no measures were deemed necessary to minimize disturbance of waterfowl.

Specific habitat enhancements were suggested, including the planting of woody riparian species along the reservoir edge and placement of large woody debris for fish habitat. It is impractical to plant riparian species along the reservoir edge because of the large water level fluctuations. Placement of woody debris was considered but dropped because concern to the safety of boaters as water levels drop through the recreation season, and such features could become a hazard. Provisions in the alternatives include coordination with ODFW on appropriate aquatic habitat projects.

2.4 Summary of Impacts

The impact analysis is presented in Chapter 3. A summary of these impacts is provided in Table 2.4-1.

Table 2.4-1. Impacts of alternatives comparison summary.*

Resource Area	Alternative A – No Action	Alternative B	Alternative C Preferred Alternative
Soils	Minor increases in erosion would result from temporary construction activity and from long-term effects of increased recreation.	Impacts would be similar to those of Alternative A but slightly less because of less development and lack of camping facilities.	Impacts would be slightly greater than those of Alternative A due to increased expansion of recreation sites and new trail construction.
Hydrology and Water Quality	There would be minor long-term increases in stormwater runoff from increases in paved surfaces and from effects of long-term recreation use.	Impacts would be similar but less than those of Alternative A because of less development.	Impacts would be slightly greater than those of Alternative A because of the amount of new impervious surfaces and increased recreation use.
Vegetation	Long-term benefits would result from weed control, rehabilitation of elk meadows, and buffer enhancements. Minor adverse effects would result from clearing of new recreation sites and increased recreation use.	Beneficial impacts would be similar to those of Alternative A, and include provisions for wetland restoration. Adverse impacts would be slightly less than those of Alternative A because of the lower amount of recreation development.	Beneficial impacts would be similar to those of Alternative A, but also includes wetland restoration measures. Adverse impacts would be greater than those of Alternatives A or B due to the greater amount of recreation development, trail construction, and increased recreation use.
Fish and Wildlife	Moderate disturbance impacts resulting from development and increased park use. Moderate habitat loss without mitigating habitat restoration. Moderate indirect impact to aquatic ecosystems from water quality degradation. Minimal beneficial impact to elk from improved management of meadows.	Minimal disturbance impacts resulting from development and increased use. Minimal habitat loss with mitigating habitat restoration. Beneficial impact to fisheries from aquatic habitat enhancement. Minimal indirect impact to aquatic ecosystems from water quality degradation due to increased recreation and resulting erosion. Beneficial effects to elk from improved management and habitat enhancement in meadows.	Greatest disturbance impacts resulting from development, increased use, and camping. Beneficial effects from habitat restoration. Beneficial impact to fisheries from aquatic habitat enhancement. Beneficial effects to elk from improved management and habitat enhancement in meadows. Direct beneficial impact to fish and wildlife and indirect benefits through water quality improvements from habitat restoration at Tanner Creek and Nelson Cove.

*Note: Only impacts that vary from those described for the No Action Alternative are described for other alternatives.

Table 2.4-1. Impacts of alternatives comparison summary.*

Resource Area	Alternative A – No Action	Alternative B	Alternative C Preferred Alternative
		Direct beneficial effects to fish and wildlife and indirect benefits through water quality improvements from habitat restoration at Tanner Creek Cove.	
Threatened, Endangered, and Sensitive Species	<p>Moderate impacts to TES species resulting from development and increased disturbance.</p> <p>Minimal benefits to TES plant species from improved control of noxious weeds.</p> <p>Minimal benefits to bald eagles from protection of perch trees.</p> <p>Minimal benefits to TES species from improved maintenance of elk meadows.</p>	<p>Minimal impacts to TES species resulting from development and increased disturbance.</p> <p>Benefits to TES plant species from comprehensive noxious weed control plan.</p> <p>Benefits to bald eagles from protection measures and cooperative monitoring.</p> <p>Benefits to downstream steelhead from water quality improvement.</p> <p>Minor benefits to TES species from habitat restoration at Tanner Creek Cove.</p>	<p>Greatest impact to TES species resulting from development and increased human disturbance.</p> <p>Benefit to TES plant species from comprehensive noxious weed control plan.</p> <p>Benefit to bald eagles from protection measures and cooperative monitoring.</p> <p>Benefits to downstream steelhead from water quality improvement.</p> <p>Minor benefits to TES species from habitat restorations at Tanner Creek and Nelson Cove.</p>
Recreation	Moderate beneficial impact from new recreation development and improvements.	<p>Moderate beneficial impact from recreation improvements.</p> <p>Minimal impacts to recreation from wildlife and vegetation enhancements.</p>	<p>Greatest benefits from new recreation development and improvements.</p> <p>Minimal impacts to recreation from wildlife and vegetation enhancements.</p>
Visual Resources	<p>Moderate impact to scenic quality of park due to increased recreation facility development.</p> <p>Minimal impact to safety/security associated with buffering facilities with vegetation.</p> <p>Minimal impact to wildlife habitat associated with vegetation thinning to restore viewsheds.</p>	<p>Minimal impact to scenic quality of park due to lower level of recreation facility development and emphasis on natural resources.</p> <p>Minimal impact to safety/security associated with buffering facilities with vegetation.</p>	Moderate impact to scenic quality of park due to higher level of recreation facility development.

*Note: Only impacts that vary from those described for the No Action Alternative are described for other alternatives.

Table 2.4-1. Impacts of alternatives comparison summary.*

Resource Area	Alternative A – No Action	Alternative B	Alternative C Preferred Alternative
Land Use	<p>Minimal impact to land use due to increased recreation facility development.</p> <p>Minimal impact to land use and natural resources by adding camping as a park activity.</p>	<p>Minimal impact to land use due to increased recreation facility development.</p> <p>Minimal impact associated with security and safety related to permitting use in the Reclamation Zone.</p>	<p>Moderate impact to land use due to increased recreation facility development.</p> <p>Minimal impact associated with security and safety related to permitting use in the Reclamation Zone.</p> <p>Minimal impact to land use and natural resources by adding camping as a park activity.</p>
Socioeconomics	Minimal benefits to local community through increased recreation use and the need for additional recreation and natural resource management.	Minimal benefits to local community through increased recreation use and the need for additional recreation and natural resource management.	Moderate benefits to local community through increased recreation use (including camping) and the need for additional recreation and natural resource management.
Public Services and Utilities	<p>Moderate impact to public services due to an increase in recreation facilities and use.</p> <p>Moderate impact to public utilities to support new recreation development.</p>	<p>Minimal impact to public services due to an increase in recreation facilities and use.</p> <p>Minimal impact to public utilities to support new recreation development.</p>	<p>Moderate impact to public services due to an increase in recreation facilities and use.</p> <p>Moderate impact to public utilities to support new recreation development.</p>
Environmental Justice	No impacts	No impacts	No impacts
Cultural Resources	There would be no impacts with the implementation of resource protection and management commitments.	Same as Alternative A	Same as Alternative A
Indian Sacred Sites	No identified impacts	Same as Alternative A	Same as Alternative A
Indian Trust Assets	No identified impacts	Same as Alternative A	Same as Alternative A

*Note: Only impacts that vary from those described for the No Action Alternative are described for other alternatives.

Table 2.4-1. Impacts of alternatives comparison summary.*

Resource Area	Alternative A – No Action	Alternative B	Alternative C Preferred Alternative
Transportation and Access	<p>Moderate impact to roads, parking, and access to and within the park due to an increased level of recreation facility development and expected use.</p> <p>Moderate impacts associated with traffic volume from new users groups due to new camping facilities.</p> <p>Minimal beneficial impact associated with opportunities for trail-based recreation and trail access.</p>	<p>Minimal impact to roads, parking, and access to and within the park due to a lower level of recreation facility development.</p> <p>Minimal benefits associated with opportunities for trail-based recreation and trail access.</p>	<p>Moderate impact to roads, parking, and access to and within the park due to a higher level of recreation facility development and expected use.</p> <p>Moderate impact, such as congestion, due to access control at entry point.</p> <p>Moderate impacts associated with traffic volume from new users groups due to new camping facilities and the education & research center.</p> <p>Moderate benefits associated with opportunities for trail-based recreation and trail access.</p>

*Note: Only impacts that vary from those described for the No Action Alternative are described for other alternatives.

3.0 Affected Environment and Environmental Consequences

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

Chapter 3 is organized by resource topic. Resource topics analyzed in detail include noise; soils; hydrology and water quality; vegetation; fish and wildlife; threatened, endangered, and sensitive species; recreation; visual resources; land use; socioeconomics; public services and utilities; environmental justice; cultural resources; Indian sacred sites; ITAs; and transportation and access. Climate, air quality, geology, paleontology, and topography are not discussed because early in the scoping and analysis process, no issues were identified regarding potential effects to these resources.

For each resource topic, the affected environment is addressed first and describes the current conditions for each resource within Reclamation lands. This is not a comprehensive discussion of every resource within the RMP study area, but rather focuses on those aspects of the environment that were identified as issues during scoping or would be affected by the alternatives.

The effects of the alternatives are described next in the environmental consequences section for each resource topic. Under the alternatives subheading, the specific impacts of each of the alternatives are discussed in terms of the actions that would occur and specific information about the impact. Only impacts that cannot be fully avoided through the application of best management practices (BMPs), listed in Chapter 5, are described.

In the environmental consequences section, the depth of analysis of the alternatives corresponds to the scope and magnitude of the potential environmental impact. This chapter compares the effects of the three alternatives described in Chapter 2:

- Alternative A – No Action – Continuation of Existing Management Practices Under the 1994 EA
- Alternative B – Minimal Recreation Development with Resource Enhancement
- Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

Alternatives B and C (Preferred Alternative) are action alternatives. Alternative A, the No Action Alternative, describes the future under the 1994 EA (i.e., if the actions in the proposed RMP were not implemented). Under this scenario, management of Henry Hagg Lake lands would continue under the guidance contained in the preferred alternative in the 1994 EA. Impacts from the action alternatives are compared to the No Action Alternative. A description of the affected environment and environmental consequences is presented for each of the alternatives. Mitigation measures and residual impacts remaining after implementation of mitigation measures are also described. Cumulative impacts are presented for each of the alternatives and are described in Section 3.1.1. A summary of impacts for each alternative is provided at the end of Chapter 2.

3.1.1 Cumulative Impacts

Reasonably foreseeable cumulative impacts that were identified for analysis under cumulative impacts include the continued population increase in the vicinity, the resulting potential increase in recreation use at Henry Hagg Lake, and the potential raising of the dam. The potential dam raise is described in Section 1.6.1.

There has been a large increase in population in the Portland metropolitan area in the 10 years since the 1994 EA was prepared, with a corresponding increase in recreation use at the reservoir. From 1990 to 2000, Washington County's population increased by 43% and adjacent Multnomah County's population increased by 13% (U.S. Census 2001).

Recreation demand is likely to continue to increase under all alternatives and would likely have negative effects on a number of resources without appropriate management actions. While it is difficult to estimate the rate of increase in future recreation demand, the effects on resources can be limited and managed by the type and amount of capacity allowed on the Reclamation lands and Henry Hagg Lake. The alternatives include provisions for controlling recreation use that will reduce but not eliminate cumulative effects from increased recreation use at Henry Hagg Lake.

3.2 Noise

3.2.1 Affected Environment

In general, the rural character of Scoggins Valley Park, Henry Hagg Lake, and the surrounding area is reflected by low ambient noise levels. Noise sources present are primarily from motorized recreational activities on the reservoir, visitors at the various recreation areas, vehicular noise on nearby roadways, and nearby local industry operations such as wood product production. The noise levels associated with these sources vary significantly depending on location, season, and time of day (Reclamation 1994).

Sensitive noise receptors in proximity to the park include residential dwellings adjacent to the park boundary. Of all the noise sources within the RMP study area, motorized recreational activities on the reservoir during the summer months and vehicular traffic on the interior road are the most prevalent. Noise from personal watercraft (PWC) and motorized boats is reflected off the water and, depending on wind and weather conditions, can be heard at locations far from their source. At the present time, however, none of the noise sources within the RMP study area are known to be significantly disruptive to visitors or wildlife. In the past 20 years there have been few complaints to park staff from nearby residents about high levels of noise (pers. comm., C. Wayland, April 2002). Complaints about noise made to the Washington County Sheriff are typically in response to parties and unauthorized fireworks (pers. comm., M. Alexander, April 2002). While weekends and holidays during summer months are expectedly noisier than other times, they remain within a reasonable level and during reasonable daytime hours. To facilitate this, the Sheriff clears the reservoir of users each evening prior to dusk and locks the gates to each boat ramp (pers. comm., C. Wayland, April 2002).

Noise measurements were taken over a 2-day period in June 1993. Sampling occurred near two residential locations adjacent to the park to determine existing sound levels from park activities such as boating, swimming, water-skiing, and PWC use. In this study, noise levels from non-park sources were estimated and differentiated from estimates of noise level from park sources only. The estimated park-source noise levels for the 2-day measurement period were used to estimate park-related noise levels during peak summer days by comparing the traffic volumes for these peak days with the traffic volumes for the 2-day measurement period. Generally, noise levels increased slightly both throughout the day and on the weekend, as shown in Table 3.2-1. These data show that the park is a relatively quiet area with moderate increases in noise associated with increased recreation use. It was estimated that if no additional recreation development occurred at the park, noise levels would increase by 2 A-weighted decibels (dBA; decibels [dB] adjusted to account for the frequency of human hearing) for weekdays, Saturdays, and Sundays by the year 2010 due to increased recreation use (Reclamation 1994). It is likely that use of the park has increased more rapidly than originally estimated and that there is or will be a resulting increase in noise levels greater than originally estimated. For comparison, decibel measurements of particular noise levels are provided in Table 3.2-2.

3.2.2 Environmental Consequences

Impacts to noise levels at the reservoir would occur under each of the three alternatives due to increased recreation demand in the region and the need for facilities to meet that current and future demand.

Table 3.2-1. Estimated noise levels (dBA) from park sources (1994).

Site	Period	Summer Peak		
		Weekday	Saturday	Sunday
1) Recreation Area A East	6 am - 12 noon	44	45	46
	12 noon – 5 pm	45	46	47
	5 pm – 9 pm	46	47	48
	11 pm – 6 am	park closed	park closed	park closed
2) Recreation Area C	6 am - 12 noon	37	37	38
	12 noon – 5 pm	40	40	41
	5 pm – 9 pm	40	40	41
	11 pm – 6 am	park closed	park closed	park closed

Source: Reclamation 1994.

Table 3.2-2. Decibel Levels of particular noises for comparison purposes.

Noise Level/Threshold	Decibels (dBA)
Jet Engine (close up)	160
Trumpet	150
Threshold of pain	130
Jet flyover at 1,000 feet	100-120
Gas lawn mower at 100 feet	90-100
Diesel truck at 50 feet	80-90
Garbage disposal at 3 feet	70-80
Normal speech at 3 feet	60-70
Quiet urban daytime	50-60
Dishwasher (next room)	40-50
Library	30-40
Concert hall (background)	20-30
Quiet rural nighttime	10-20
Threshold of hearing	0-10

Source: www.coolmath.com, <http://shpna.org/caltrain/caltdbexmpl.htm>

Increased use within the park, expanded facilities, and the potential for camping could affect the amount of noise levels locally around the reservoir. However, BMPs associated with each of the three alternatives would help protect and improve the existing resource. For example, contractors would be required to comply with all applicable Federal, State, and local laws and regulations concerning prevention and control of noise and air pollution. Contractors are expected to use reasonably available methods and devices to control, prevent, and reduce atmospheric emissions or discharges of atmospheric contaminants and noise. In addition, potential camping areas would be subject to limits on noise from 10 p.m. – 7 a.m., and campgrounds would be in operation only from April through October.

3.2.2.1 Alternative A - No Action - Continuation of Existing Management Practices

In general, noise levels at the park may be affected by the increase in recreation users and the expansion of facilities that are proposed in Alternative A. Recreation facilities are proposed for all existing recreation areas, particularly Recreation Area A East (including 70 campsites), Recreation Area A West, and Recreation Area C. Noise levels can be expected to increase temporarily during construction of new and expanded facilities. Long-term noise levels could be expected to increase proportionally with the

increase in number of users. It is likely that an increase in the supply of recreation resources due to growing demand would result in greater use. Specific impacts are discussed below.

A minor benefit would result from the use of vegetation buffers that would disperse or absorb noise from current and future use of roads and recreation areas. There would be some minor, short-term increases in noise associated with enhancement of the elk meadows and increasing the area from 100 to 140 acres.

A negligible adverse impact would result from noise generated by mowing these meadows (a likely maintenance prescription); however, this activity would be done infrequently, limited to daytime hours, seasonal in nature, and is generally accepted by recreation users as appropriate for maintenance in park settings. Likewise, a negligible adverse impact would also result from noise generated by mowing or weed-wacking associated with noxious weed control activities at the park. Continuation of current enforcement services at the park and reservoir would have a beneficial impact as a deterrent to unwanted and unacceptable noise sources (e.g., partying). The continuation of special events would have minor, temporary noise impacts because they frequently take place during normally quiet hours. For example, triathlons typically begin early on Sunday mornings. A beneficial impact would result from the continuation of WACO's information program by making park users aware of appropriate and inappropriate noise generating activities and the hours that certain activities are allowed to take place.

In general, there would be impacts from noise associated with the development of specific recreation facilities. Short-term noise impacts would result from construction of these facilities and would be addressed by the BMPs previously discussed. Long-term noise impacts would result from larger and/or additional facilities and use at the park. Specifically, camping at Recreation Area A East (70 sites) would generate noise earlier and later in the day in an area that currently has little noise (due to the current closure of the area). This is unlikely to affect landowners outside the park because of the rising topography between the campground and the park border, the vegetative buffering around the campground, the lack of sensitive noise receptors, the distance to private residences, and the noise policies that would be established for the campground (quiet time from 10 p.m. to 7 a.m.). The noise-related impact to Recreation Area A East would also be limited to between April 1 and October 31.

Enhancement or expansion of all other recreation sites at the park is proposed and would result in a minor adverse impact from increased recreation noise.

Mitigation Measures and Residual Impacts (Alternative A)

Alternative A would cause no substantial noise-related impacts; therefore, no mitigation measures are needed. Residual impacts are discussed above.

Cumulative Impacts (Alternative A)

It is likely that the Portland metropolitan area will continue to expand, and the population will continue to grow. It is also likely that the demand for recreation at Scoggins Valley Park will also continue to increase. It is likely that there will be a corresponding increase from noise-generating sources such as automobiles, watercraft, and people at the park.

Noise in the park would be affected if the reservoir level were raised. A significant percentage of the land and several of the recreation sites would be inundated. Construction of the dam extension,

roadwork, and associated activities would substantially increase noise levels in the park during the construction phase.

3.2.2.2 Alternative B - Minimal Recreation Development with Resource Enhancement

In general, noise levels at the park may be affected by the increase in recreation users and the expansion of facilities that are proposed in Alternative B. However, less recreation development is proposed in Alternative B than the other two alternatives. The impact of this alternative's actions on noise would likely be less than the other two alternatives. Minimal facilities are proposed for all existing sites, and no development is proposed in the Recreation Area C Extension site (i.e., the Cove Area). Improvement and expansion of facilities are proposed at sites that already exist and already experience high levels of use during the peak season. Noise levels can be expected to increase temporarily during construction of expanded facilities. Long-term noise levels could be expected to increase proportionally with the increase in number of users. It is likely that an increase in the supply of recreation resources due to growing demands would result in greater use. Noise from the perimeter road would also be likely to increase as more people travel to and through the park. Specific impacts to noise in Alternative B are the same for those in Alternative A except for those discussed below.

Enlargement of the elk meadows and maintenance would have minor temporary noise impacts as discussed in Alternative A. The proposal for a disc golf course and associated parking at Sain Creek meadow would have a negligible adverse impact by facilitating a small increase in recreation use. A minor adverse impact to noise would result from the proposal to maintain clear and open view corridors between roads and parking areas for enforcement purposes by reducing vegetative noise buffers.

In general, there would be noise impacts associated with the development of specific recreation facilities. Short-term noise impacts would result from construction of these facilities and would be addressed by the BMPs previously discussed. Long-term noise impacts would result from larger and/or additional facilities and use at the park. While Alternative B proposes re-opening Recreation Area A East for day use, no camping is proposed as in the other two alternatives. A negligible adverse impact due to increased noise would result from opening an area to recreation that is currently closed. Noise would also be expected to increase at all areas being improved and expanded as use of these sites would likely increase.

Mitigation Measures and Residual Impacts (Alternative B)

Alternative B would cause no substantial noise-related impacts and no mitigation measures are necessary. Residual impacts are discussed above.

Cumulative Impacts (Alternative B)

Cumulative impacts for Alternative B would be similar to those discussed previously for Alternative A, although to a lesser extent due to the lower level of proposed recreation in this alternative.

3.2.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

In general, noise levels at the park may be affected by the increase in recreation users and the expansion of facilities that are proposed in Alternative C. This alternative proposes the highest level of expansion and applies to all existing recreation areas in the park. It is likely that an increase in the supply of

recreation resources due to growing demand would result in greater use. Specific noise impacts in Alternative C are the same as for those in Alternative A except as described below.

Minor adverse noise impacts may result from the implementation of a limited access plan on the perimeter road. This action could result in minor traffic congestion in this area and thus increased noise levels associated with congestion.

There would be noise impacts associated with the development of specific recreation facilities. Short-term, noise impacts would result from construction of these facilities and would be addressed by the BMPs previously discussed. Long-term noise impacts would result from increased use at the new or expanded facilities. Specifically, camping at Recreation Area A East (100 sites at build-out) would generate noise earlier and later in the day in an area that currently has little noise (due to the current closure of the area). This would have similar effects to those discussed in Alternative A. More noise would be expected to be generated at Recreation Area A West with the expansion of parking for vehicles and boat trailers, which would likely result in increased use. More noise would also be expected to be generated at the Cove Area since a doubling of the existing parking area is proposed and would result in additional use. Noise impacts would also result from a new parking area for vehicles and horse trailers adjacent to the proposed equestrian trail.

In general, the education & research center proposed at Nelson Cove would have a minor impact on noise levels. Short-term construction of the facility would increase noise levels and have a temporary adverse noise effect on park users. In the long term, most of the noise generated would be related to perimeter road vehicle traffic of users (including school buses) and employees. Traffic noise on the perimeter road would have some minor effect on nearby residents. Noise at the center itself would be minimal. Impacts to nearby residents would be negligible because the center is proposed on a peninsula more than ½ mile from the park boundary. Impacts to recreation users on the reservoir or nearby trails would be negligible compared to other noise sources, such as watercraft. It is also likely that use of the center would continue throughout the year and create the potential for noise impacts during months other than the peak summer season.

Mitigation Measures and Residual Impacts (Alternative C)

Alternative C would cause no substantial noise-related impacts; therefore, no mitigation measures are necessary. Residual impacts are discussed above.

Cumulative Impacts (Alternative C)

Cumulative impacts for Alternative C would be similar to but slightly greater than those discussed previously for Alternative A, because of the greater camping capacity and the environmental education & research center.

3.3 Soils

3.3.1 Affected Environment

Soils in the vicinity of Henry Hagg Lake are derived from the weathered marine sediments and volcanic rocks that form the east slopes of the Coast Range. Soil profiles in the area generally consist of a thin layer of topsoil mantling a deeper layer of residual soils. Area topsoil is composed of organic silt with lesser amounts of fine sand. The underlying sediments consist of material formed from extensive weathering and mixing of the existing marine sediments with the Tertiary volcanic rock formations. This residual soil is generally well-drained and characterized by a soft, tan-to-brown, moist, clay-to-clayey sand with scattered decomposed fragments of sedimentary and volcanic rock (Reclamation 2000).

The moderately steep topography of the Scoggins Valley, coupled with the extensive annual precipitation, has resulted in area soil deposits created largely through alluvial processes. The 14 soil types that occur in the vicinity of Henry Hagg Lake are listed in Table 3.3-1 (USDA 1982). The specific locations of occurrence of soil types in and around Scoggins Valley Park are shown in Figure 3.3-1.

Many of the soil types located on the steeper slopes (>10%) in the study area represent moderate to severe erosion hazards. In general, the geologic process of sediment accumulation that resulted in the formation of the majority of study area soil types also resulted in soil characteristics conducive to erosion. Subsurface material formed from alluvial (related to surface water), colluvial (sediment deposited at the base of slopes), and eolian (wind-weathered) processes tend to be non-cohesive and subject to slippage along steep slopes. However, these same soil types tend to be well-drained with slow runoff in more level areas, which may mitigate the potential for erosion.

Soil erosion in surrounding lands and the resulting deposition of sediments into Henry Hagg Lake have been long-standing concerns of land managers even prior to development of the reservoir. In planning for park development prior to the construction of Scoggins Dam, potential sediment yield and lost reservoir capacity were estimated. No formal written report is available documenting these sediment yield estimates. However, Table 3.3-2 presents data on estimated potential sediment yield and capacity reduction presumably based upon 1955 planning studies as reported by Water Resources Services to Reclamation (Ferrari 2000). The estimated sediment yields are slightly higher than estimates for other western reservoirs likely due to assumed local precipitation, surrounding steep topography, or actual data from sediment load sampling prior to park development (Reclamation 2000).

Actual rates of sediment deposition in Henry Hagg Lake are thought to be close to the pre-reservoir estimates identified above. Reclamation, in a report entitled *Geologic Report on Sediment Accumulation and Distribution in Henry Hagg Lake* (Reclamation 2000), documents the nature and extent of sediment deposits at the mouths of Scoggins, Sain, and Tanner Creeks. The investigation focused on exposed sediments during a mild drought period in November 1999. The majority of the lakebed sediment deposition was found to occur below elevation 270.0 feet, corresponding to the level at which the reservoir is maintained for flood storage during the winter storm period when the majority of the sedimentation occurs. The area of accumulation around the mouths of Scoggins, Sain, and Tanner Creeks was estimated at 60 acres, 30 acres, and 10 acres respectively. The depth of post-reservoir deposits in these areas averaged 2.5 feet, ranging from 0.5 to 5 feet. Based upon this 2.5 feet average

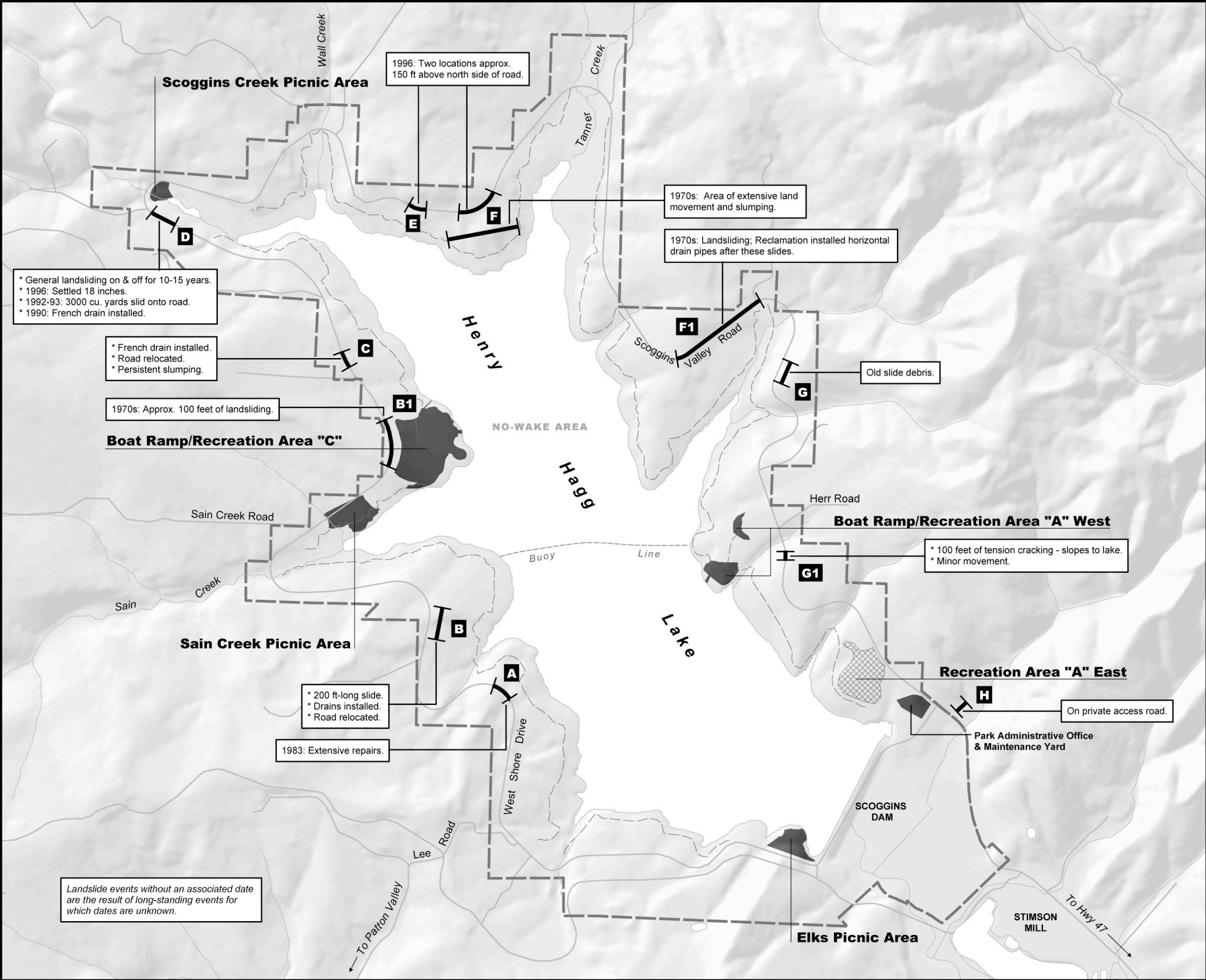
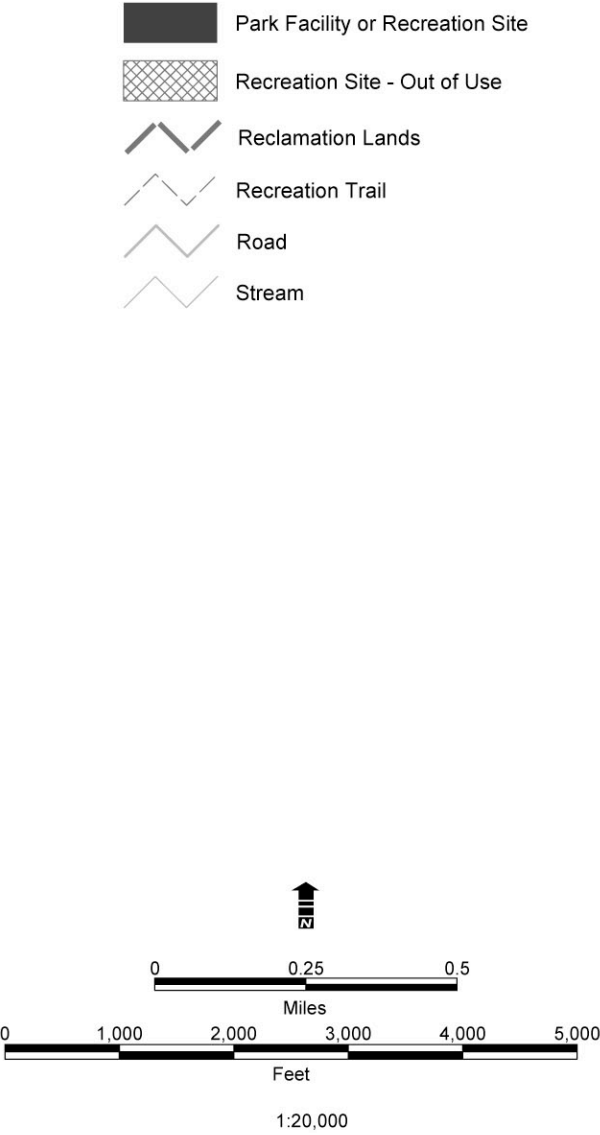


Figure 3.3-1
Landslides



Henry Hagg Lake RMP
Draft Environmental Assessment

Back of Figure 3.3-1

Table 3.3-1. Soil types adjacent to Henry Hagg Lake.

Map Unit	Soil Type	Slope	Depth to Bedrock	Erosion Hazard	Soil Characteristics
6B	Carlton Silt Loam	0-7%	>65 in	slight-moderate	moderately well-drained silty clay loam; permeability is moderate to slow
8C	Chehalem Silty Clay Loam	3-12%	>50 in	slight-moderate	gently sloping to moderately steep on alluvial fans; runoff is slow to medium,
10	Chehalis Silt Loam	Nearly level	>60 in	slight	well-drained, silt loam surface with heavy silt loam subsoil; runoff slow
9	Chehalis Silty Clay Loam	Nearly level	>60 in	slight	deep, well-drained; runoff slow; located on smooth flood plains
19B,C,D,E	Helvetia silt loam	2-30%	>60 in	slight-severe (depending upon slope)	moderately well-drained; moderately slow permeability; slightly acid; four soil types and map units based on slope
29B,C,D,E, F	Laurelwood Silt Loam	3-60%	>70 in	slight-severe (depending upon slope)	deep, well-drained; moderate permeability; acidic, formed in silty eolian material overlying fine-textured uplands
30	McBee Silty Clay Loam	30-65%	>65 in	slight	moderately well-drained; moderate permeability; silty clay loam surface, dark clay loam subsoil
31B,C,D,E, F	Melbourne Silty Clay Loam	2-60%	>65 in	slight-severe (depending upon slope)	deep, well-drained; moderately slow permeability; silty clay loam, formed in residuum and colluvium weathered from sedimentary rock
35C,D,E,F, G	Olyic Silt Loam	5-90%	40-60 in	moderate –severe (depending upon slope)	well-drained; moderately slow permeability; silt loam surface layer; silty clay loam subsoil 30 inches thick
36C,D,E,F	Pervina Silty Clay Loam	7-60%	40-60+ in	moderate-severe (depending upon slope)	well-drained; moderately slow permeability, from sedimentary rock residuum and colluvium, over siltstone and shale at 40-60+ inches
38B,C,D,E, F	Saum Silt Loam	2-60%	50 in	slight-severe (depending upon slope)	well-drained; silt and silty clay loam; medium acid profile; slow runoff
39E,F	Tolke Silt Loam	5-60%	>60 in	moderate-severe	well-drained, from eolian materials in volcanic ash, moderate permeability
40	Udfluvents	nearly level	varies with subsoils	slight	heterogeneous mixture of soils deposited in concave streambeds, silt, loams, cobbles, pebbles; moderate permeability; runoff slow, often ponded
43	Wapato Silty Clay Loam	0-3%	varies with subsoils	slight	poorly drained; runoff slow; vernal ponding; bottomlands along streams

Source: US Soil Conservation Service, 1982.

Table 3.3-2. Pre-reservoir estimated sediment yield and capacity reduction.

Original capacity	59,910 af
Drainage area	40.6 square miles
Projected annual sediment yield	0.51 af/square mile
Projected sediment inflow	2,000 af/100 years
Lost capacity in 100 years	3.3%

Source: Reclamation 2000.

depth, the total volume of sediments exposed at low water during 1999 field studies was estimated at 250 af (Reclamation 2000).

Using data collected from the exposed sediments investigated in November 1999, Reclamation was able to estimate the amount of submerged lakebed sediments accumulated since the construction of Scoggins Dam. The total area of sediment accumulation in the irregularly shaped, submerged depositional area was estimated at 100 acres. Based on an average thickness of 2.5 feet, the volume of submerged sediments was estimated at 250 af. Thus, Reclamation concluded that in 1999 the total volume of accumulated sediments (exposed at low water plus those submerged at low water) deposited in Henry Hagg Lake was approximately 500 af. This translates to a total sediment accumulation rate of 19.2 af per year, only slightly below the pre-reservoir estimate of 20 af annually. A bathymetric survey has been scheduled for the near future to more precisely assess the actual sediment accumulation in Henry Hagg Lake since dam construction (Reclamation 2000).

The combination of underlying lithology and surface soils in the Scoggins Creek watershed makes the lands around Henry Hagg Lake highly susceptible to slumping and landslide activity. Washington County Department of Land Use and Transportation (DLUT) has monitored landslide activity in the vicinity of local access roads – in particular, Scoggins Valley Road and West Shore Drive – since prior to their development. Repair and mitigation for landslide activity along park roads are frequent and widespread (pers. comm., G. Clemmons, 2002). In the 1970s, extensive slide activity was noted on Scoggins Valley Road along the north shore of the reservoir and north of Nelson Cove, and on West Shore Drive near the current location of Recreation Area C. More recent land movements have been noted along West Shore Drive south of Scoggins Creek and along Scoggins Valley Road 0.75 mile north of the dam (pers. comm., G. Clemmons, 2002). In addition, extensive localized areas of slippage along Scoggins Valley Road north of the reservoir and on all park roads in general resulted from the extensive precipitation and associated flooding of 1996. In addition, Reclamation surveyed the landslide activity in 1999 (Reclamation 1999). Figure 3.3-1 shows the location of known major slides in Scoggins Valley Park recorded since the creation of Henry Hagg Lake.

Reclamation identified landslides in several areas as early as 1968. Slopes within slides vary in steepness from 5 to 60%. Since completion of the perimeter road in 1975, landslides have caused persistent maintenance problems for Washington County Road Operations and Maintenance personnel. The slides occur in both natural formation and man-placed fill materials and seem to be activated primarily by increases in precipitation and general raising of the local groundwater. In response to the landslides, a number of studies and corrective measures were initiated. Based on a 1980 engineering review, major

road relocation was performed on critical areas, specifically Slides B, C, and F (Figure 3.3-1). In conjunction with this road work, horizontal drains were installed at most of the significant slide areas (Reclamation 1999).

Drains were installed at eight locations between 1974 and 1986. The 1999 inventory indicated that two of the eight sets of drains (Slides E and F) were still providing visible drainage. Of the remaining six sets, four could not be found and were assumed to have been sheared by subsequent slide movement, covered by slide debris and vegetation, or excavated during repair of the landslide-damaged road. The horizontal drains installed at Slides B and F were destroyed shortly after installation. Regular maintenance was recommended to keep the remaining drains functional.

Although all of the critical landslides along Scoggins Valley Road are active, it appears that most are not affecting safe operation of the road. Slide C, south of Scoggins Creek, has undergone steady deformation of the past few years and continues to be a road maintenance problem.

A number of landslides also occur outside of the park boundary on private timber lands. One notable slide is located about 2 miles north of the reservoir and was estimated at a volume of 50,000 cubic yards. While outside of the park, these slides have affected water quality in the reservoir as streams carry the mobile sediment.

3.3.2 Environmental Consequences

Alteration to the pattern and rate of erosion in the RMP study area is of primary concern in consideration of the three alternatives. Changes in land use practices in the park could have the potential to affect erosion and sedimentation rates. In addition the several active landslides around the reservoir affect road maintenance and the potential placement of recreation facilities or new elk meadows.

Improvements to park facilities and recreation areas would be accompanied by stormwater management systems that would reduce erosion. Likewise, habitat restoration and native vegetation planting in areas previously impacted by human disturbance would decrease erosion in the park. Shoreline restoration and enhancement of peripheral wetland habitat would provide natural bank stabilization and decrease the rate of erosion in those areas of the reservoir exposed during drawdown. In addition, management considerations pertaining to recreation activities on Henry Hagg Lake would affect shoreline erosion rates.

Construction of facilities could potentially cause increases in erosion. To minimize this risk, the BMPs listed in Chapter 5 would be implemented for any construction or earth-moving activities.

3.3.2.1 Alternative A – No Action - Continuation of Existing Management Practices

Developing vegetative buffers around recreation sites would provide minor benefits by improving soil stability and reducing runoff. Implementing the elk meadow management plan would result in increased elk forage, but tilling would be required to rehabilitate the meadows. Any ground-disturbing activity would be completed according to Reclamation's BMPs to minimize the potential for erosion and sedimentation.

Implementing stormwater drainage control at parking areas would continue to reduce the amount of contaminants reaching the reservoir. Continued enforcement, control of special events, and providing public information would reduce the improper use of the park's lands and facilities, and reduce the potential for damage to vegetation and increase in erosion.

Developing campsites at Recreation Area A East would require some grading and clearing. Removal of vegetation and earth-moving could increase erosion, but the implementation of BMPs would minimize this risk. Improvements to Recreation Area A West would have negligible effects to soils. Minor amounts of clearing would be required for additional connections to the shoreline trail under Alternative A. However, trail design would follow accepted standards to minimize erosion.

There would be no effects to soils from implementing minor improvements to the Scoggins Creek Picnic Area. Earth-moving for this improvement would follow Reclamation's BMPs to minimize erosion and sedimentation. In addition, any parking lot expansion would be designed to properly handle stormwater runoff to minimize erosion risk. Similar effects, but on a smaller scale, would be expected from the addition of parking for 129 cars at the Recreation Area C Extension area. Improvements to Sain Creek Picnic Area and the Elks Picnic Area would not affect soils.

Mitigation and Residual Impacts (Alternative A)

No mitigation measures are required. Residual impacts from implementation of Alternative A are discussed above.

Cumulative Impacts (Alternative A)

Continued growth in recreation use around the reservoir would cause continued soil compaction and loss of vegetation from human use in the vicinity of recreation sites. These actions would cause a minor cumulative adverse effect by increasing soil erosion and sedimentation. Continued logging, road building, and residential development within the larger watershed will likely increase erosion and the amount of sediment flowing into the reservoir. Raising the level of the dam to increase the size of the reservoir would likely mobilize sediments along roadbeds, landslides, cleared areas, and other unstable areas and temporarily increase the sediment load of the reservoir.

3.3.2.2 Alternative B – Minimal Recreation Development with Resource Enhancement

Maintenance of buffer zones and planting of woody species in riparian zones would aid in reducing soil erosion by maintaining soil integrity. Rehabilitation of the elk meadows would have similar effects to those described under Alternative A. In addition, the provision for maintaining an herbaceous buffer between the reservoir and tilled areas of the meadows would ensure that improving the meadows would not cause increases in erosion.

Development of an impoundment at the mouth of Tanner Creek could reduce the amount of eroded sediments entering the central portion of the reservoir. Eroded sediments would likely accumulate behind (upstream) of the cofferdam. While the rate of sediment entering Henry Hagg Lake would not be significantly affected by cofferdam installation, localization of the sediment deposits would represent a benefit to reservoir management as these areas could be more easily dredged and increased storage volume could, therefore, be maintained in the central portion of the reservoir.

Coordinating with agencies that are implementing soil and erosion projects upstream of Reclamation lands may aid these endeavors and reduce the amount of excess erosion in the watershed. Provisions for enforcement of park rules would have similar effects to those described under alternative A.

Use of Recreation Area A East as a day use area only would require less earth-moving than for the construction of campsites under Alternatives A or C. Improvements to Recreation Area A West, Scoggins Creek, and Recreation Area C would have similar effects to soil as those described under Alternative A. There would be no effects to soil at the Recreation Area C Extension area because no development is proposed under Alternative B. There would be no effects to soil at Sain Creek and the Elks Picnic Areas because no changes are proposed under Alternative B. The small parking area for disc golf users at the Sain Creek elk meadow would have negligible impacts.

In general, Alternative B would have the least effect to soils among the alternatives because of the smaller scale of the proposed recreation-related improvements.

Mitigation Measures and Residual Impacts (Alternative B)

No mitigation measures are required for the implementation of Alternative B. Residual impacts are discussed above.

Cumulative Impacts (Alternative B)

Cumulative impacts would be similar to those described under Alternative A.

3.3.2.3 Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

Effects from overall wildlife and vegetation management to soils would be similar to those described under Alternative B. In addition, Alternative C would potentially install a cofferdam wetland at the mouth of Nelson Cove, if feasible. This may reduce the amount of sediment reaching the reservoir; unlike Tanner Creek Cove where the other potential wetland is proposed, however, Nelson Cove is not associated with a perennial stream. Less sediment is produced via this drainage and the benefits likely would be less than a cofferdam wetland at Tanner Creek.

Erosion and sedimentation control measures and coordination with other agencies on sediment control projects would provide similar effects to those described under Alternative B. Enforcement of park use rules and special events and the continued public information program would provide similar benefits to those described under Alternative A.

Pending feasibility studies and site planning, implementation of a limited access plan could increase the potential of erosion and sedimentation if any earth-moving or new roads were required. Any plan would be implemented using Reclamation's BMPs, minimizing the potential for erosion.

Development of Recreation Area A East is greatest under Alternative A and poses the highest potential for excessive erosion because of the relative amount of earthwork that would be required compared to the other alternatives. Under Alternative C, however, the camping facilities would be developed under a two-phase approach that would provide for easier control of construction practices and erosion control measures. Reclamation also would implement BMPs for construction and earth-moving, thus minimizing the risk of excessive erosion.

In addition to the effects discussed under Alternative B for Recreation Area A West, Alternative C includes the construction of additional parking. There would be a minor increase in the potential for construction-caused erosion, but implementation of Reclamation's BMPs would minimize such risks.

Development of the shoreline trail to be routed entirely off the perimeter road would require vegetative clearing, trail work, and likely the construction of bridges over drainages. In addition, Alternative C would allow for the development of a separate equestrian trail and parking facilities by equestrian groups, if feasible. Such a trail would entail new construction on the outside of the perimeter road. Clearing of vegetation and trail grading during construction could cause additional erosion into nearby drainages. It also would be necessary to construct bridges over drainages and wet areas to prevent damage to sensitive soils by horses. Trail work under Alternative C has the greatest potential for adverse effects to erosion among the three alternatives. However, construction would be required to follow Reclamation's BMPs, thus minimizing soil erosion risks.

Construction of the education & research center would potentially increase the amount of erosion from earth-moving activity and from the concentrated use patterns once it was operating. Siting of the facility and grading would be undertaken to reduce the potential for excessive erosion and sedimentation. In addition, BMPs established by Reclamation would be implemented during construction. Even under ideal conditions, construction of a facility of this size would likely contribute to additional soil erosion during construction. Soil and erosion control measures would minimize these impacts.

Proposed measures for the Scoggins Creek Picnic Area and Recreation Area C would have similar effects to those described under Alternative A. Development of facilities at the Recreation Area C Extension area also has the potential to increase erosion during construction. In particular, phase two would include construction of parking and an additional road. These measures would require a substantial amount of earthwork. Implementation of soil erosion control measures defined in the BMPs would be expected to reduce, but not eliminate, the risk of erosion. Additions to the facilities at Sain Creek and the Elks Picnic Areas would have no effects to soils.

Mitigation Measures and Residual Impacts (Alternative C)

No mitigation measures are necessary for the implementation of Alternative C. Residual impacts are discussed above.

Cumulative Impacts (Alternative C)

Cumulative impacts would be similar to those described under Alternative A.

3.4 Hydrology and Water Quality

3.4.1 Affected Environment

3.4.1.1 Surface and Groundwater

Henry Hagg Lake is maintained by a watershed of 40.6 square miles located in the foothills of the northern Coast Range of Oregon. Water is conveyed to the reservoir via three primary tributaries: Scoggins Creek from the northwest, Tanner Creek from the northeast, and Sain Creek from the west. Combined in-flow from these major tributaries ranges from more than 2,000 cfs during months of high precipitation to a flow of less than 10 cfs during the low-flow summer period of May through October (USGS 2002a, 2002b).

Most streams in the Scoggins Creek watershed are perennial. However, flows vary with seasonal extremes, with high peaks in winter and very low flows during the summer months. The period from November to March accounts for 84% of annual flow in the gauged, unregulated streams of the Upper Tualatin-Scoggins Creek watershed (BLM 2000). Table 3.4-1 shows average streamflow both above and below Henry Hagg Lake for representative data year 2000. The percentage flow contribution for each significant tributary is estimated at 69% for Scoggins Creek, 28% for Sain Creek, and 3% for Tanner Creek (Reclamation 2000).

Table 3.4-1. Scoggins, Tanner, and Sain Creek monthly flow data (2000).

	Monthly Average Flow in cfs											
	Jan	Feb	Mar	Apr	May	Jun	Jul y	Aug	Sep	Oct	Nov	Dec
In-flow to Henry Hagg Lake												
Scoggins Creek	127	124	87.9	29.1	30.1	30.1	8.81	3.74	4.00	7.07	15.8	44.0
Tanner Creek	12.0	7.90	7.58	2.87	1.77	1.33	0.90	0.00	0.00	0.03	0.33	1.39
Sain Creek	70.9	60.2	53.7	20.4	17.6	14.9	6.46	2.13	1.82	3.45	7.09	25.5
Combined In-flow	210	192	149	52.4	49.5	46.3	16.2	5.87	5.82	10.6	23.2	70.9
Out-flow from Henry Hagg Lake												
Scoggins Creek	205	64.7	105	22.4	47.8	80.1	131	179	143	116	51.8	10.0

Source: Compiled from USGS Stream Gauge Records and Scoggins Dam reservoir Operations Data in the 2000 Annual Report of the Tualatin River Flow Management Technical Committee. USA 2000.

Scoggins Dam and Henry Hagg Lake are part of the Tualatin Project, a Reclamation project first conceptualized in the 1960s and developed in the mid 1970s specifically to provide water storage for municipal and industrial uses, water quality control in the downstream reaches of the Tualatin River, recreational opportunities, conservation of fish and wildlife resources, flood control, and irrigation. Of the 53,640 af of active capacity at Henry Hagg Lake, approximately 14,000 af are designated for supplemental municipal and industrial purposes, and 16,900 af of water are made available to improve water quality in the Tualatin River through scheduled releases to augment natural low flows (Reclamation 2002).

The original natural surface hydrology of the Scoggins Creek subbasin, a component of the larger Tualatin River drainage basin, directed water from the upper reaches of the subbasin above the Sain

Creek and Tanner Creek tributaries through approximately 7 miles of relatively high gradient riffle habitat to enter the Tualatin River at river mile (RM) 62.8. From this point in the Tualatin River mainstem to its confluence with the Willamette River upstream of Oregon City, Oregon at Willamette RM 28.5, flows were generally slow moving, passing through wide reaches with peripheral wetland and riparian habitat.

Ecosystems within the Tualatin River watershed have been significantly affected by human development and encroachment with resultant changes to the natural Scoggins Creek and Tualatin River watercourses including: channel straightening and relocation, bank armoring, draining of peripheral and associated wetland habitat, riparian vegetation removal, general urbanization of adjacent lands, and the damming of the natural stream channels both at Scoggins Dam and Tualatin RM 3.4. Since the implementation of the Tualatin Project and construction of Scoggins Dam, flow not diverted for municipal and industrial or agricultural uses is conveyed downstream to augment Tualatin River flows to maintain a minimum monthly mean flow of 120 cfs from June to August and 150 cfs for September to November as measured at Tualatin RM 33.3 (Tualatin River Watershed Council 2002). Flow augmentation is not necessary December – May.

Precipitation within the Tualatin River watershed is characterized by a typical Mediterranean climate with prolonged winter rainfall and summer drought conditions. Higher elevation precipitation, such as found in the upper reaches of the Scoggins Creek subbasin, can amount to 100 to 120 inches annually, while lower elevations, such as the lower reaches of the Tualatin mainstem, typically receive 36 to 48 inches annually (ODEQ 2001). Surface flows conveyed through the Scoggins Creek and Tualatin River watercourses from Henry Hagg Lake travel a total distance of approximately 68 miles, from an elevation of 283.5 feet at the Scoggins Dam spillway crest to 49 feet above sea level where the Tualatin River flows into the Willamette River mainstem (Reclamation 2002; ODEQ 2001).

A description of surface hydrology pertaining to Henry Hagg Lake would be incomplete without mention of the irrigable land affected by Scoggins Creek flow. Some 17,000 acres of land encompassing an area approximately 17 miles long and 15 miles wide located west of the metropolitan area of Portland receive irrigation water from Henry Hagg Lake (Reclamation 2002). By making a dependable water supply available throughout the growing season, the creation of Henry Hagg Lake has ensured increased agricultural production of a variety of crops. Irrigation water is released from the dam into Scoggins Creek and pumped into a gravity-fed distribution network of over 100 miles of pipe at the Patton Valley Pumping Plant on Scoggins Creek about 2.5 miles downstream of the dam and the Spring Hill Pumping Plant 9 miles downstream of the dam on the Tualatin River. In addition, 4,800 acres of land located nearby the watercourses are served by direct pumping of released storage water from Scoggins Creek and the Tualatin River (Reclamation 2002).

3.4.1.2 Water Quality

The Oregon Department of Environmental Quality (ODEQ) monitors and regulates the quality of Oregon's streams, lakes/reservoirs, estuaries, and groundwater. Water quality standards are established to protect the "Beneficial Uses" associated with a particular water body. In general, protected Beneficial Uses pertain to fisheries, aquatic life, drinking water, recreation, and irrigation. Oregon Administrative Rules (OAR Chapter 340, Division 41, Table 6) list specifically identified Beneficial Uses occurring within the Tualatin River watershed (Table 3.4-2) applicable to Henry Hagg Lake and the Scoggins

Creek subbasin (ODEQ 2001). Water quality standards for individual pollutants are established to protect the Beneficial Use(s) most sensitive to potential impacts.

Table 3.4-2 Beneficial Uses identified by ODEQ as occurring in the Tualatin River subbasin.

Beneficial Uses most sensitive to DO insufficiency, as noted in lower Scoggins Creek, are shaded.			
Beneficial Use	Occurring	Beneficial Use	Occurring
Public Domestic Water Supply	X	Salmonid Fish Spawning	X
Private Domestic Water Supply	X	Salmonid Fish Rearing	X
Industrial Water Supply	X	Resident Fish and Aquatic Life	X
Irrigation	X	Anadromous Fish Passage	X
Livestock Watering	X	Wildlife and Hunting	X
Boating	X	Fishing	X
Hydro Power	X	Water Contact Recreation	X
Aesthetic Quality	X	Commercial Navigation & Transportation	

Source: Tualatin Subbasin Total Maximum Daily Load (TMDL). Oregon Department of Environmental Quality 2001.

ODEQ is mandated according to Section 303(d) of the Federal Clean Water Act (CWA) to list water bodies within the state where one or more water quality standards are not being met. This 303(d) list includes the Tualatin River mainstem and many tributaries and/or stream reaches within the Tualatin River watershed. The Tualatin River mainstem is listed as *water quality limited* for not meeting water quality standards pertaining to ammonia, phosphorous, temperature, bacteria, and dissolved oxygen (DO), Scoggins Creek is listed only for seasonal DO insufficiencies in the lower reaches below Scoggins Dam (ODEQ 2001).

The portion of Scoggins Creek included on the 303(d) list for DO violations includes the lower reach from Scoggins Dam to its confluence with the Tualatin River. This listing pertains only to the time period from November 1 through April 30 when DO levels in the creek have been identified as dropping below DO water quality standards. The lower reach of Scoggins Creek is considered spawning habitat for cutthroat trout (*Oncorhynchus clarki*), coho salmon (*O. kisutch*), and steelhead (*O. mykiss*). Based on these beneficial uses identified as most sensitive to the effects of low DO, the DO water quality criterion is established at 11.0 mg/L (ODEQ 2001). For the years 1994-1998, DO concentrations were found to be below this water quality standard in 19 of 55 samples collected in the lower reach of Scoggins Creek. The median DO concentration for all samples collected during this time period is 11.4 mg/L, and the median DO percent saturation was 94% (ODEQ 2001).

Previous analyses of the DO levels in the lower reaches of Scoggins Creek have been complicated by the fact that no DO data had been collected in the reservoir itself. Prior to 1999, Scoggins Creek subbasin water quality information that included data on DO levels had only been collected at old Highway 47 (RM 1.5). Without specific information on DO levels in Henry Hagg Lake, the cause of the low DO levels in the downstream reaches of Scoggins Creek could not be confirmed. The low levels of DO were thought to result from either low DO levels in the water released from Henry Hagg Lake or from DO sinks downstream of the dam. DO sinks may develop from high biological oxygen demand (BOD) in runoff draining to Scoggins Creek; potentially high BOD discharges from the Forestex lumber mill located along Scoggins Creek downstream of the dam; and high sediment oxygen demand (SOD) resulting from decomposing organic material in creek bed sediment (ODEQ 2001).

To better understand the cause of the low DO levels in lower Scoggins Creek, the Unified Sewerage Agency (USA, now called Clean Water Services) developed the Hagg Lake Watershed Monitoring Program, a 5-year comprehensive water quality monitoring program initiated in 1999. In addition to DO data, Clean Water Services now collects data on water temperature, pH, conductivity, turbidity, transparency, water chemistry, suspended solids, macroinvertebrates, and bacteria at various depths in Henry Hagg Lake and its three principal tributaries (USA 2000). A summary of water quality criteria for Hagg Lake based upon these data is presented in Table 3.4-3.

Table 3.4-3. Approximate range of Henry Hagg Lake water quality criteria based upon 2000 collection data.

	Water Temp (°C)	pH	DO (mg/L)	Conductivity (µS/cm)	Turbidity (NTUs)	Transparency (in.)	Total Coliform/100 ml (MPN)	NH ₃ , total N (mg/L)
Summer Months	10.0-25.0	5.8-7.2	0.5-8.0	50.0-60.0	2.0-10.0	80-150	20-200	<0.01-0.01
Winter Months	5.0-12.0	6.8-7.8	9.0-12.0	60.0-130.0	8.0-40.0	40-140	5-70	<0.01-0.01

Source: Scoggins Watershed Hagg Lake Field Data in *Tualatin River Flow Management Technical Committee 2000 Annual Report*, Unified Sewerage Agency

Initial water quality data for Henry Hagg Lake collected by USA appear to confirm that the low DO levels in the downstream reaches of Scoggins Creek result from relatively low DO levels in the impounded waters of Henry Hagg Lake. However, because Scoggins Dam represents a fish passage barrier preventing the spawning of salmonids sensitive to decreased levels of DO, the reservoir and tributaries in the upper reaches of the Scoggins Creek subbasin are considered suitable for all identified Beneficial Uses as defined by ODEQ.

Although Henry Hagg Lake and Scoggins Creek are not 303(d) listed for temperature violations, water temperature in the reservoir and the Scoggins Creek subbasin is an important water quality consideration. Water is released from Scoggins Dam to both augment flows and improve water quality in the Tualatin River, which is listed for temperature violations, with temperatures in the lower reaches of the Tualatin often exceeding the 64°F (17.8°C) temperature criterion during the summer months (ODEQ 2001). Like most reservoirs, Henry Hagg Lake undergoes seasonal thermal stratification and thus influences downstream temperatures differently depending on the time of the year. Henry Hagg Lake is a bottom release reservoir and draws from the deeper hypolimnion water layer, which is significantly cooler than Tualatin River flows during the early summer months. In the late summer when the reservoir has been drawn down, Scoggins Dam releases from the warmer epilimnion water which can, at times, exceed temperatures in the mainstem Tualatin.

Turbidity, suspended sediments, and sediment deposition into the reservoir are major water quality concerns in Henry Hagg Lake. The lithology and sedimentary soils of the Scoggins Creek watershed make the area highly susceptible to surface erosion. In addition, the sedimentary formations in the

watershed are weak and susceptible to slumping and landslide activity. Eroded sediments are conveyed through surface waters to Henry Hagg Lake. This has resulted in the accumulation of approximately 500 af of sediments, which represents a total loss of 0.83% of reservoir volume (Reclamation 2000). Although the rate of sediment accumulation (estimated at 19.2 af per year) is approximately consistent with the pre-reservoir estimate of 20 af per year, the large amount of sediment entering Henry Hagg Lake may be largely responsible for problems with water quality. Specifically, this sediment contributes to BOD and the diminished DO levels in the reservoir and the lower reaches of Scoggins Creek.

3.4.2 Environmental Consequences

In general, the primary concern in regard to hydrology is maintaining natural surface flow while developing sites and adding impervious surfaces. General water quality considerations include minimizing erosion and subsequent sediment accumulation in the reservoir, controlling non-point source pollution from runoff, and maintaining water quality standards.

Surface and groundwater hydrology may be differentially affected by the three alternatives depending on the extent and nature of associated development. Increasing the amount of impervious surface – facility structures, paving, etc. – increases surface water runoff and could potentially increase soil erosion. Under all alternatives, the potential for increased erosion would be minimized through the use of BMPs during siting, design, and construction of new facilities or development. These BMPs, described in Chapter 5, include the design and implementation of appropriate stormwater treatment and collection facilities concomitant with the addition of impervious surfaces and new structures. Even with the implementation of these BMPs, however, there is likely to be some increase in stormwater runoff that could contribute to water quality degradation.

Water quality parameters potentially affected by implementation of the three alternatives include turbidity, DO, and temperature. Actions associated with the three alternatives may differentially alter the amount and rates of erosion in land peripheral to the reservoir. Increased erosion will increase water turbidity and benthic sediment deposits, whereas improvements to stormwater collection and treatment facilities may decrease turbidity. Changes to the type and amount of soil sediment conveyed to Henry Hagg Lake may alter both SOD and BOD in the reservoir and influence DO levels. In addition, installation of cofferdams may offer opportunities for increased aeration of reservoir water through plunges and spillway drops, potentially increasing DO levels. Further, direct water quality impacts could result from increases or decreases in accidental spillage of oil and gasoline if alternative actions result in alterations in the use of the park by recreationists.

3.4.2.1 Alternative A – No Action, Continuation of Existing Management Practices

As described under Soils (Section 3.3.2), planting of vegetative buffers around recreation sites would improve soil stability and reduce erosion, thus helping to reduce stormwater runoff and potential effects from erosion. Restoration of the elk meadows could have negative effects on water quality if excessive erosion were caused by tilling of the soil and fertilizing. Any such soil disturbance would be conducted during the dry season and according to Reclamation's BMPs. Consequently, these effects would be negligible.

Installing stormwater drainage control at parking lots with appropriate filtering mechanisms would reduce effects to reservoir water quality from oil, grease, and other contaminants from parking surfaces.

Continued enforcement of park rules and special events and a public information program would discourage inappropriate recreation use and reduce negative effects to vegetation and soils. These measures would preserve water quality by reducing potential impacts from increased erosion.

Development of campsites and associated facilities at Recreation Area A East would cause some minor adverse effects to hydrology and water quality. Clearing of vegetation, development of campsites, and the increased human use of the area would cause soil compaction, increases in runoff, and reductions in ground vegetation (Cole and Landres 1995; Zabinski and Gannon 1997). Implementation of BMPs during construction and proper design of stormwater facilities would minimize but not eliminate the effects of construction and operation of the facility to water quality. The location of the camping facility, on a small bluff with a forest buffer near the reservoir, would aid in absorbing increased runoff and reducing the flow of contaminants to the reservoir.

Paving the parking lot at Recreation Area A West would make the parking area impermeable to surface water, thus increasing runoff. BMPs and proper design guidelines would be used for stormwater collection and conveyance, which would minimize but not eliminate effects to stormwater runoff and water quality. Invariably, contaminants from parking areas would be carried to drainage ways and would eventually flow into the reservoir. This is particularly unavoidable in some areas of the parking lot where the paving above the boat ramp slopes toward the water.

Improving trail connections to the shoreline trail would involve minor amounts of trail work. Construction connections with the use of BMPs would not affect surface water hydrology or water quality. The addition of a new groundwater sources at the Scoggins Creek Picnic Area would not substantially affect groundwater hydrology because of the relatively minor demand that day use would place on the system.

Improvements to Recreation Area C would include parking for an additional 245 cars. Addition of impermeable surface is expected to increase the amount of stormwater runoff and flow of parking lot contaminants into the reservoir. Implementation of stormwater management designs and construction and operation BMPs would reduce this adverse effect but would not eliminate it completely.

Expansion of facilities at the Recreation Area C Extension would also include increasing parking near the road. Paving the parking area would have similar effects to stormwater runoff and surface water quality as described above. The parking lot for the Recreation Area C Extension would be adjacent to the existing road and about 75 yards from the reservoir edge; thus, there is a wide swath of land that would reduce the amount of contaminants reaching the reservoir. There would be similar minor, adverse effects from paving the parking lot at the Elks Picnic Area.

Mitigation and Residual Impacts (Alternative A)

No mitigation measures are proposed for Alternative A. Residual impacts are discussed above.

Cumulative Impacts (Alternative A)

Under all of the alternatives, it is likely that recreation use of the reservoir and the surrounding lands will continue to increase. Even with properly designed facilities and enforcement, there would be dispersed use in undesignated sites and the related impacts to vegetation and soil. These actions, and those of

increased runoff of road and parking lot contaminants, would cumulatively affect water quality. The potential dam raise would affect water quality; the rise in water elevation would cover developed sites and parking areas and road and parking lot surface pollutants would be introduced into the water column.

3.4.2.2 Alternative B – Minimal Recreation Development with Resource Enhancement

Installation of a cofferdam wetland at Tanner Creek would be completed during the time of the year when the water is low to prevent adverse effects to water quality. Once the cofferdam and the wetland are established, it would provide minor improvements to water quality by trapping sediments carried into the reservoir from Tanner Creek. Removal of sediments from behind the dam would need to be completed at regular intervals. Effects of the elk meadow rehabilitation would be similar to those described under the Soils section. Use of an undisturbed herbaceous buffer between the reservoir and the tilled portion of the meadows would reduce the amount of sediment that would reach the reservoir during the early stages of establishing elk forage.

Coordination with local and State agencies on erosion control projects outside of Reclamation land would potentially reduce the amount of sediment that reaches the reservoir. A larger factor in this process, however, is the commercial timber operations, road building, and residential development occurring in the basin outside of Reclamation land. Continued enforcement of park rules, special events, and use of public information would have similar effects as those described under Alternative A.

No camping facilities are proposed at Recreation Area A East under Alternative B. Consequently, the effects to hydrology and water quality would be less than those of Alternative A. The addition of a boat dump facility and a fish cleaning station would aid in improving water quality by collecting and disposing of waste that might otherwise be discharged into the reservoir. Trail improvements would be limited to new connections to the shoreline trail, and the impacts would be similar to those described under Alternative A. Improvements to the Scoggins Creek Picnic Area would be minor and would have negligible effects to water quality. Expansion of parking and the addition of impervious surfaces at Recreation Area C would cause minor adverse effects to surface water hydrology and water quality, similar to those described under Alternative A. The addition of a fish cleaning station at Recreation Area C would provide minor benefits for water quality.

There would be no impacts to hydrology or water quality at the Recreation Area C Extension area, Sain Creek Picnic Area, or the Elks Picnic Area under Alternative B because no changes to the existing conditions are proposed. In general, Alternative B would have less adverse effects to hydrology and water quality than Alternative A because of the smaller amount of new facilities and the inclusion of some measures that would provide minor benefits to water quality.

Mitigation and Residual Impacts (Alternative B)

No mitigation measures are proposed for Alternative B. Residual impacts are discussed above.

Cumulative Impacts (Alternative B)

Cumulative Impacts would be the same as those described under Alternative A.

3.4.2.3 Alternative C – Moderate Recreation Development with Resource Enhancement

Alternative C includes the potential of installing cofferdams for wetland creation at Tanner Creek Cove and at Nelson Cove, which could provide minor benefits to water quality by trapping sediments that flow into the reservoir. Because Tanner Creek is a perennial stream and there is no perennial watercourse at Nelson Cove, a cofferdam wetland at Tanner Creek would provide greater benefits from sediment control. Maintenance of buffer zones around recreation sites would provide similar benefits to those described under Alternative B.

Improvement to the elk meadows and the implementation of a monitoring plan would provide some minor benefits to hydrology and water quality, similar to those described under Alternative B. The addition of a floating restroom under Alternative C would provide minor water quality benefits for the reservoir by providing a convenient restroom for boaters.

Enforcement of park rules, special events, and continued public education would provide similar, minor benefits to hydrology and water quality as described under Alternative B. Depending on the feasibility, a limited access plan could be implemented under Alternative C. If this action required construction of a new road, there could be some minor effects to hydrology and water quality from temporary construction effects and long-term effects of developing new impervious surfaces. BMPs defined in Chapter 5 would minimize effects from construction and operation of any such facilities.

Developed camping at Recreation Area A East is proposed in two phases. Phase one would implement tent camping, which would have minor effects to hydrology and water quality from the clearing of vegetation and the heightened human use and associated soil compaction and trampling of vegetation. The addition of RV sites under phase two would have additional minor effects to hydrology and water quality by increasing the amount of impervious surface, stormwater runoff, and non-source pollution from vehicle contaminants such as oil and grease from parking areas. Implementation of proper stormwater design and BMPs would minimize but not eliminate these effects.

In addition to the effects described under Alternative B for Recreation Area A West, the actions under Alternative C would contribute additional, minor adverse effects to water quality. The increase in impervious surface for parking would increase the amount of stormwater runoff and associated pollutants from vehicles. Again, proper stormwater controls would minimize these adverse effects.

Trail development under Alternative C would have adverse effects to hydrology and water quality. There would be some negligible impacts from routing the shoreline trail off of the perimeter road, primarily during the construction phase. The greater potential impact would be from the construction and use of an equestrian trail above the perimeter road. Construction would need to occur on some steep slopes and pass over drainages leading to the reservoir. Construction, particularly near the drainages, could mobilize sediments that would flow into the reservoir during the rainy season. A number of soils that surround the reservoir are susceptible to erosion when disturbed, which increases the risk for increased sedimentation. Use of the trail by horses would also cause some minor adverse effects to water quality due to continued disturbance of soils and the addition of horse manure. While the trail is not adjacent to the reservoir due to the nature of horse use on relatively erodible soils, it would be prudent to limit the use of the trail when soil conditions are most stable. In addition to the effects of trail use, the development of a parking area would increase the amount of impervious surface around the reservoir. Vehicle pollutants and horse manure would be carried off the parking surface when it rains. Proper stormwater controls would reduce but not eliminate this adverse effect.

Development of the environmental education & research center at Nelson Cove could potentially affect surface water hydrology and water quality of the reservoir. Construction of the facility, parking areas, internal roads, and trails would disturb and compact soil. Limiting construction to the dry season may not be feasible because of the size and complexity of the project. Careful implementation of BMPs would be required to minimize excess sediment reaching the reservoir because of the proximity of the education & research center to the water. Once the buildings and parking areas are established, the increased use of vehicles would leave more pollutants on parking areas that would eventually be carried by rain into drainage ways. Implementation of BMPs and sustainable designs would minimize but not eliminate these effects. In addition, the substantial increase in human use of the area would compact soils and vegetation and add minor adverse effects to stormwater runoff and sedimentation.

Implementation of improvements at Scoggins Creek Picnic Area and Recreation Area C would have similar effects to those described under Alternative B. The addition of a fish cleaning station at Recreation Area C under Alternative C would provide a minor benefit to water quality.

Expansion of the Recreation Area C Extension area would have adverse effects to stormwater hydrology and to water quality. The primary concern is the expansion of parking and the development of a new road. These impervious surface features would reduce water infiltration and increase runoff of vehicle-produced oils and grease. Implementation of storm water controls and BMPs would help to alleviate these effects but would not eliminate them. There would be minor improvements at the Sain Creek and Elks Picnic Areas, which would have similar effects to hydrology and water quality as described under Alternative A.

Mitigation and Residual Impacts (Alternative C)

In general, Alternative C would have the greatest adverse effect to surface water hydrology and water quality among the alternatives because of the greater amount of impervious surface development and the potential for construction of the environmental education and the equestrian trail. If a horse trail is developed by interest groups, riding on the trail should be limited to the park's general recreation season to avoid trail damage during the wet season and the increased risk of sedimentation, erosion, and adverse effects to water quality.

Cumulative Impacts (Alternative C)

Cumulative impacts would be similar to those described under Alternative A. Even with seasonal restrictions, there would be erosion caused from equestrian use as described above.

3.5 Vegetation

3.5.1 Affected Environment

3.5.1.1 Cover Types

Figure 3.5-1 shows the general vegetation cover types within the RMP study area and on the adjacent lands. During drawdown, the shoreline is dominated by extensive exposed mudflats. Exposed unvegetated mudflats consisting of the bathymetric sediment deposits of Henry Hagg Lake can extend from the high water shoreline over 1,000 feet (depending on topography) during periods of low precipitation and when the water level is lowered to provide storage for winter flood control (Reclamation 2000). When the water level is high, cover types along the immediate shoreline include emergent wetlands, riparian shrub, and areas where upland grassland and forested habitat extend to the waterline.

Cover types not directly associated with the waters of Henry Hagg Lake or its tributaries are generally upland mesic communities with low-to-moderate slopes ranging from 5 to 25%. Upland cover types in the RMP study area can be divided into two general descriptive categories: forested and grassland. Forested areas account for more than 70% of the upland habitat in the RMP study area and include: conifer forest, mixed (coniferous/deciduous) forest, clearcuts less than 1 year old, clearcuts 1 to 5 years old, and managed tree farms. Grassland areas in the vicinity of Henry Hagg Lake include: general upland grassland (typically used for agriculture), upland grassland with mixed shrub, and those grassland areas designated as elk mitigation meadows. The following narrative describes the primary components of each vegetation category. Vegetation association acreages are listed in Table 3.5-1.

Table 3.5-1. Area of vegetation associations on Reclamation lands at Henry Hagg Lake*.

Vegetation Association	Area in Acres
Conifer Forest	810
Mixed Forest	111
Upland Grassland	140
Elk Meadow	110
Mixed Shrub/Upland Grassland	195
Riparian	14
Wetland	34
Developed	35

*Other vegetation associations described below occur outside Reclamation boundary. Acreage is approximate.

Source: EDAW 2002.

Conifer Forests

Much of the forested land in the Scoggins Creek watershed is managed for timber harvest. Thus, all forested areas in the region are second-growth, with the most mature forested areas in the vicinity of the reservoir estimated at approximately 90 to 110 years old (Reclamation 1994). Within Scoggins Valley Park, where the forested areas are no longer managed for timber, most stands have not been thinned

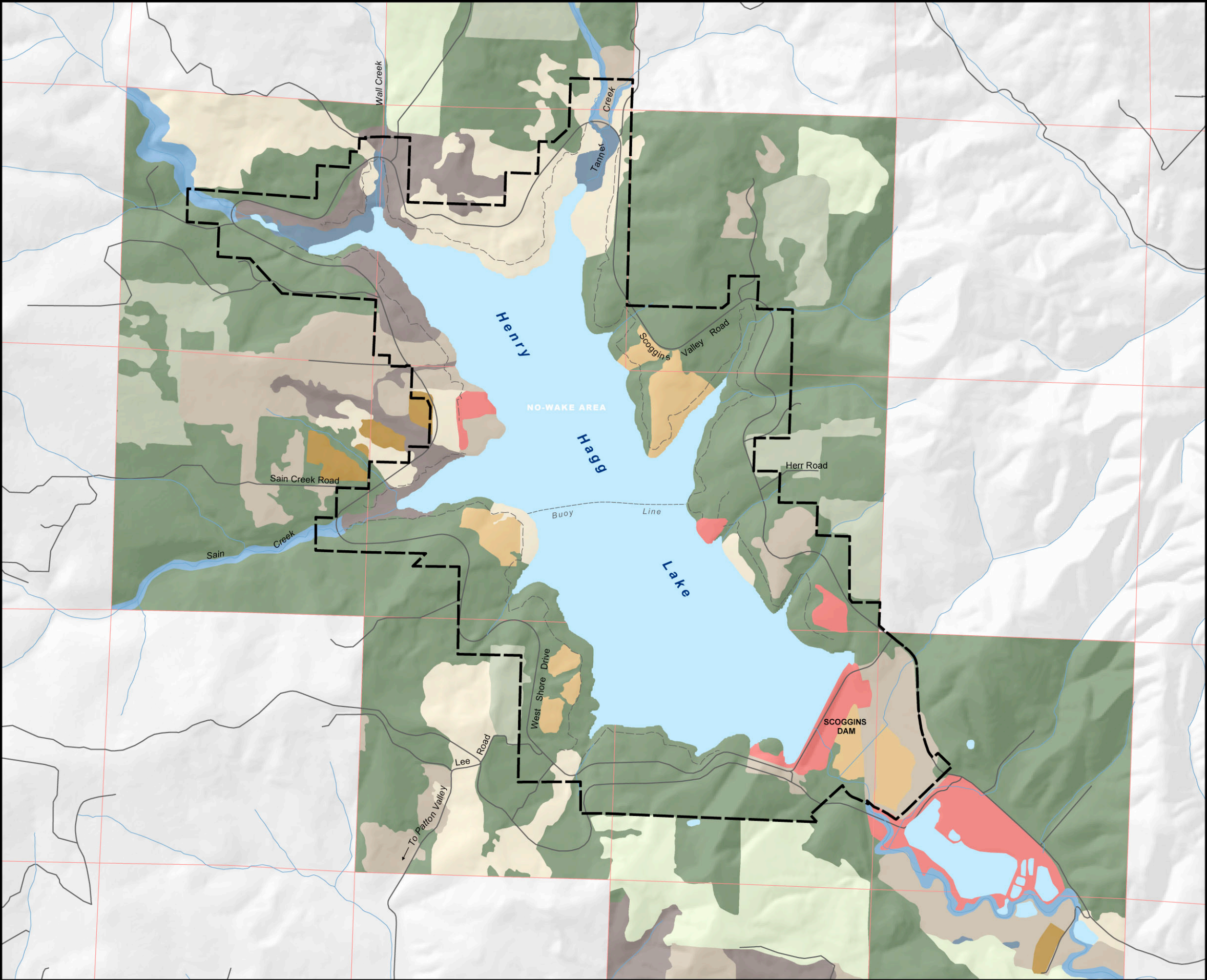


Figure 3.5-1
Vegetation Associations



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resulting in dense coniferous stands with a poorly developed understory. A recent exception is Recreation Area A East, where some marketable timber was removed and underbrush was thinned.

Conifer forest in and around Scoggins Valley Park is dominated by second growth Douglas fir (*Pseudotsuga menziesii*) with lesser components of western hemlock (*Tsuga heterophylla*) and western red cedar (*Thuja plicata*). Limited understory species in these dense stands often include a thin ground cover of trailing blackberry (*Rubus ursinus*), occasionally mixed with Pacific rhododendron (*Rhododendron macrophyllum*), vine maple (*Acer circinatum*), and red-osier dogwood (*Cornus stolonifera*).

Clearcuts

Much of the land surrounding the RMP study area is managed for logging. Two clearcut classifications were used in the vegetation cover map to provide information on the relative stage of regeneration and general habitat values for wildlife. These clearcuts were dominated by Douglas-fir before harvest. Clearcuts have been classified as < 1 year old or 1-5 years old. The < 1 year old clearcuts have minimal vegetative cover from regenerating trees and shrubs. The clearcuts that are classified as 1 to 5 years old have sapling trees and often dense upland shrubs such as ocean spray (*Holodiscus discolor*) and elderberry (*Sambucus* sp.), and young deciduous trees, particularly red alder (*Alnus rubra*).

Tree Farms

Several Christmas tree farms are located adjacent to the RMP study area. These differ from the young clearcuts because of the regular spacing of conifers up to 10 feet tall.

Mixed Forest

A deciduous overstory component is often evident in forested stands near the shores of Henry Hagg Lake. Red alder is a fast-growing hardwood species that is often first to establish in disturbed areas. This species can be found around the recreation facilities and reservoir shoreline in the park. Alder also dominates much of the riparian forest near the reservoir and its tributaries. Big-leaf maple (*Acer macrophyllum*) is often a minor stand component in upland Douglas-fir forests and is prevalent in many of the forested stands rimming the periphery of the reservoir.

Upland Grasslands

Upland grassland areas in the RMP study area include a mixture of elk meadows and unmaintained grasslands within the park boundary. Outside the park, upland grassland are dominated by livestock pastures and private agricultural pastures. Elk meadows are sites maintained in upland grassland habitat as mitigation for habitat loss from the construction of Scoggins Dam and are discussed in a following subsection (3.5.1.2). Unmaintained grassland habitat in the park occurs along the northern margin of the reservoir.

Mixed Shrub/Upland Grassland

A shrub component consisting of native willow species (*Salix* sp.) and non-native invasive weedy species such as Scot's broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus discolor*) has

established in some upland grassland areas. Himalayan blackberry is common along the north shore and other open areas. Scot's broom is a common vegetation component in the open areas such as the field near Recreation Area A West that is the septic field. This vegetation association is a small component of the vegetation at Henry Hagg Lake and generally occurs along the northern shoreline.

Wetland

Wetlands perform many important ecological functions. These include providing primary production in the food chain, stabilizing the shoreline, improving water quality, providing flood control, contributing to groundwater recharge and streamflows, and offering essential fish and wildlife habitat. Wetland and riparian communities in the RMP study area are generally located along the shores of Henry Hagg Lake at the mouth of tributaries of Scoggins Creek and Tanner Creek.

Species in the emergent wetland communities along the reservoir shore include sedges (*Carex* sp.), rushes (*Juncus* sp.), and a variety of wetland grass species. In addition, many of the localized areas of emergent wetland have a component of shrubby hydrophytic vegetation including willow (*Salix* sp.), red-osier dogwood, and black cottonwood (*Populus balsamifera*) saplings. The limited emergent wetland communities along the shores of Henry Hagg Lake may go through periods of desiccation and re-establishment or relocation in response to the seasonal and extended cycles of reservoir fluctuation.

Riparian Vegetation

Riparian vegetative communities define the native structural vegetation developed along lake and creek shores. Within Scoggins Valley Park, this includes the non-upland vegetative communities shading the reservoir and its associated tributaries. Overstory species common to riparian communities in the RMP study area include red alder, black cottonwood, willow, and Oregon ash (*Fraxinus latifolia*). Common riparian understory species include beaked hazelnut (*Corylus cornuta*), ocean spray (*Holodiscus discolor*), and vine maple. These species are also found in abundance along stand edges, canopy gaps, and moist draws. Riparian habitat in the RMP study area predominantly occurs along the stream channels of the three major tributaries: Sain, Scoggins, and Tanner Creeks.

Developed Areas

Areas in the RMP study area classified as developed are dominated by buildings, docks, boat ramps, and parking lots. Recreation Area A East was given a Developed/Forested classification because of the second-growth forest that remains around the existing roads and parking lot.

3.5.1.2 Elk Meadows

Construction of Scoggins Dam and the subsequent filling of the reservoir flooded agricultural fields used as wintering deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*) habitat. Originally, nine elk meadows were designated around the reservoir as mitigation for the loss of wintering forage in the valley behind the dam. While there does not appear to be a final written agreement between ODFW and Reclamation, notes from meetings indicate the direction for management of these parcels. In general, these parcels were to be fertilized and mowed to maintain healthy grass forage for wintering deer and elk. Over the years, there were changes to the management and location of some of the elk meadows. Figure 3.5-2 illustrates the parcels currently being managed as elk meadows.

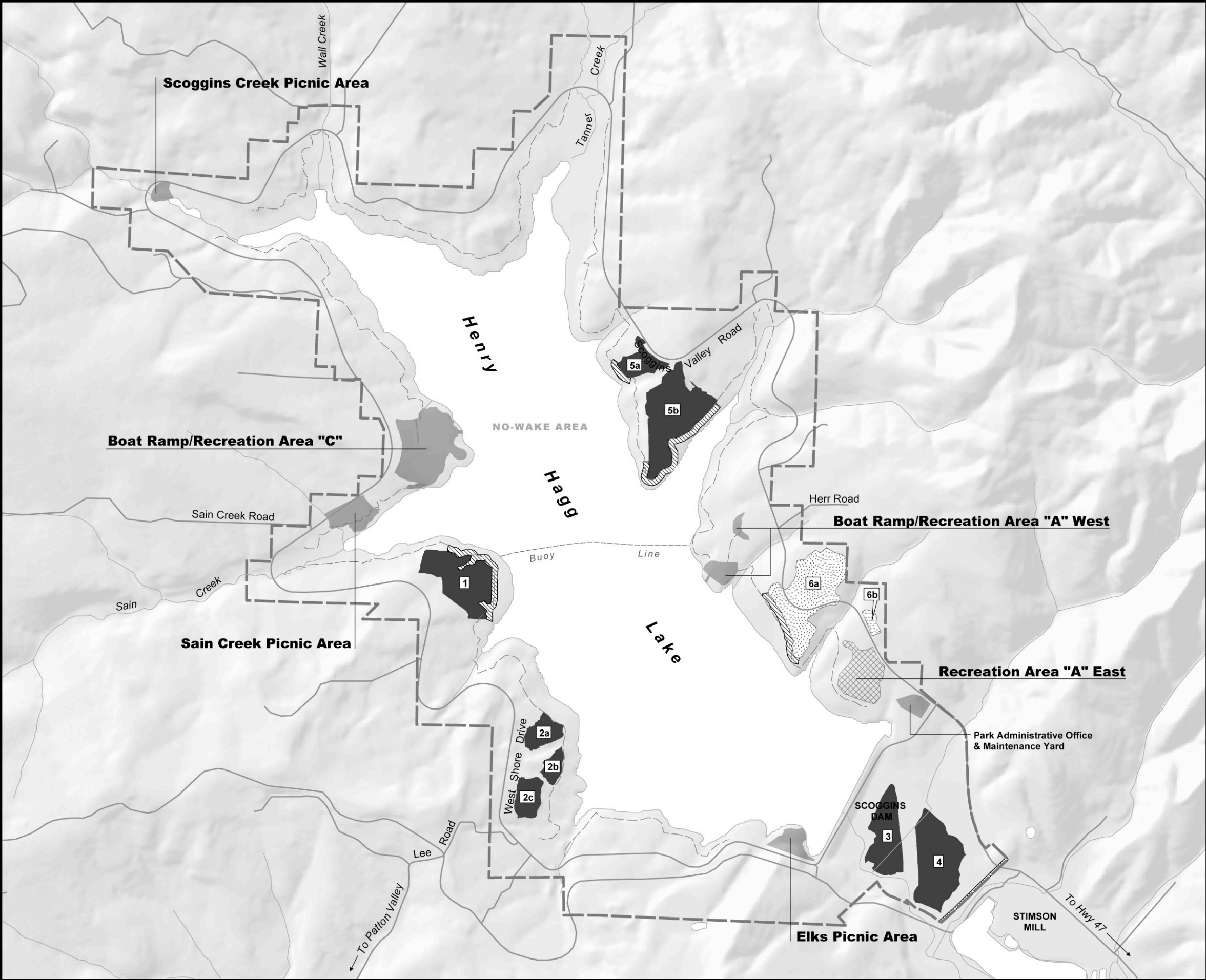
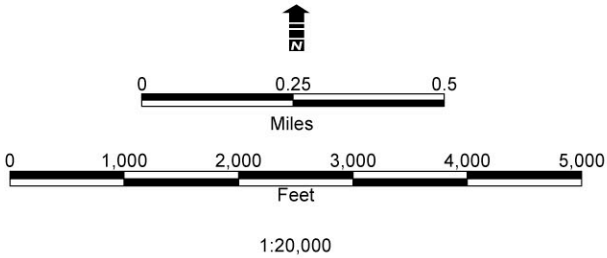


Figure 3.5-2
Elk Meadows

- Existing Elk Meadow ¹
- Future Elk Meadow ¹
- Elk Meadow Buffer
- Future Recreation Site
- Park Facility or Recreation Site
- Reclamation Lands
- Recreation Trail
- Road
- Stream

¹ Number on elk meadow designates priority for restoration



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Back of Figure 3.5-2

Currently there are 10 parcels within the park designated as elk meadows and maintained by WACO (Figure 3.5-2). These parcels total 110 acres in area. Five parcels that were originally designated as elk meadows along the northern half of the reservoir were not implemented and are not currently maintained by WACO. In addition, two parcels (#3 and 4) below the dam that was not originally designated as an elk meadow are intensely managed for elk forage. Parcel 3 is managed by WACO, and Parcel 4 is managed by TVID through a lease agreement with a local farmer. The farmer is allowed to keep the hay cutting from the field in exchange for maintenance of this parcel.

Reclamation has been working with ODFW and USFWS through the RMP process to develop an appropriate management plan for the elk meadows that satisfies the general goals for these parcels originally discussed between Reclamation and ODFW. The collaboration has resulted in a draft elk management plan (Appendix B). The plan calls for the rehabilitation and maintenance of the existing 110 acres of elk meadow with the addition of about 30 acres of elk meadow. This new meadow is proposed for a parcel of land between Recreation Area A East and Area A West that is currently the drainfield for Recreation Area A West. This site is currently infested with Scot's broom and Himalayan blackberry. The plan includes provisions for monitoring elk use of the meadows. If elk do not use the rehabilitated meadows, further implementation strategies will be determined by Reclamation in coordination with USFWS and ODFW at the end of the 10-year RMP period.

3.5.1.3 Noxious Weeds

Infestations of noxious weeds have established in Scoggins Valley Park in areas of previous disturbance. For the purpose of this study, noxious weeds include plant species on the Oregon Department of Agriculture (ODA) Oregon Noxious Weed List. The Oregon State Weed Board, a division of ODA, defines a noxious weed as “exotic, non-indigenous, species that are injurious to public health, agriculture, recreation, wildlife, or any public or private property” (ODA 2002). Major infestations of noxious weeds in the park are primarily limited to Himalayan blackberry and Scot's broom. These species are found in grassland habitats around the reservoir. Both species are ODA “B” designated weeds indicating “a weed of known economic importance which occurs in the state in small enough infestations to make eradication/containment possible; or is not known to occur, but its presence in neighboring states makes future occurrence in Oregon seem imminent” (ODA 2002).

Noxious weeds upstream of the reservoir during the Scoggins Creek Density Management, Wildlife Enhancement and Watershed Restoration Project include St. John's wort (*Hypericum perforatum*), bull or common thistle (*Cirsium vulgare*), English holly (*Ilex aquifolium*), and tansy ragwort (*Senecio jacobaea*) (BLM 2001). All of these weed species are found commonly throughout western Oregon in open dry areas and are likely present within the RMP study area. These species all have an ODA “B” designation. Tansy ragwort also has an ODA “T” designation indicating a “priority noxious weed designated by the State Weed Board as a target weed species on which the department will implement a statewide management plan” (ODA 2002).

There is currently no weed control plan for Scoggins Valley Park. The managing partner actively manages noxious weeds in the park through a program of seasonal mowing of the elk mitigation meadows, and spraying of trails, parking areas, and picnic areas for noxious weeds. Less developed areas of the park do suffer from infestation of non-native species, including Himalayan blackberry and Scots broom. However, Reclamation is in the process of developing a comprehensive Integrated Pest

Management (IPM) Plan. The IPM Plan also will include provisions for controlling other pests, such as zebra mussels.

3.5.1.4 Rare and Sensitive Species

Rare and sensitive species include those species listed as Federal Species of Concern (SoC) that also have an Oregon Natural Heritage Program (ONHP) rank of 3 or 4. The USFWS (in correspondence to Reclamation dated May 17, 2002) identified special status plant species that historically occurred or potentially could occur in the vicinity of Henry Hagg Lake. None of the special status plant species identified by the USFWS as potentially occurring in the study area meet criteria for rare and sensitive species as defined in this RMP. All identified special status plant species meet more-sensitive TES criteria (Federal listing with an ONHP rank of 1 or 2) and are thus discussed in Section 3.6.

3.5.2 Environmental Consequences

For all alternatives, the primary potential detrimental impacts to vegetation are disturbance from development, increased human use, or changing patterns of use in the park. Increased human disturbance or facilities development could result in vegetation loss and damage, increases in weed species distribution, and loss of habitat for wildlife.

Beneficial impacts to vegetation communities could result from specific elements within alternatives. Aspects of the alternatives have been specifically designed and anticipated to benefit vegetation communities around the periphery of Henry Hagg Lake. Revegetation with native plant species would restore areas previously affected by human disturbance and development, increasing the amount of available wildlife habitat. Similarly, placement of impoundments or cofferdams at creek mouths in Henry Hagg Lake would provide a consistent hydrologic regime, resulting in an increase in emergent wetland habitat. Several BMPs, listed in Chapter 5, address use of native plants and restoration of disturbed areas.

The alternatives and their potential associated effects to vegetation are discussed in the narrative below.

3.5.2.1 Alternative A – No Action - Continuation of Existing Management Practices

Improving vegetative buffers around developed areas would provide some habitat and noise buffers between areas of human activity and adjacent habitat. The enhancement and expansion of the elk meadows would provide open space and wildlife habitat and aid in control of noxious weeds. In addition, continued compliance with Washington County weed control ordinances would reduce the occurrence of weeds in the park.

The use of native plants for landscaping around project facilities would provide some minor wildlife habitat, primarily for songbirds. Under Alternative A, some view corridors to the reservoir would be maintained through selective thinning of shrubs and small trees. While the height of some shrubs would be trimmed, vegetation would not be cleared to the ground. This limited amount of vegetation trimming would not substantially affect vegetation or wildlife habitat. Provisions for increased enforcement of park rules and continued public information programs would reduce damage to vegetation from off-trail and non-approved uses.

The addition of camping to Recreation Area A East would remove vegetation from the clearing of tent and RV sites and from the increased human use and associated disturbance to vegetation. Much of the needed roadway and parking areas are existing, but additional clearing would be required. Small areas would be cleared for tent platforms, picnic tables, and RV parking. Enforcement of proper use would minimize but not eliminate effects from dispersed human use within and adjacent to the campground. Planting of native vegetation also would offset the adverse effects of human disturbance to vegetation.

Added facilities at the Recreation Area A Boat Ramp, Scoggins Creek Picnic Area, Sain Creek, and the Elks Picnic Area would not affect vegetation resources. In contrast, expansion of parking at the Recreation Area C Boat Ramp and the Recreation Area C Expansion site would require the removal of vegetation. Some compensation of this vegetation loss would be provided by the planting of native vegetation around the facilities, but much of the area in the proposed Recreation Area C Expansion is a maintained grass field with relatively low habitat value. Loss of this vegetation is a minor adverse effect compared to clearing of shrubs and trees with a higher habitat value. Clearing of vegetation would be kept to a minimum for all new recreation development according to BMPs listed in Chapter 5.

Mitigation and Residual Impacts (Alternative A)

No mitigation measures are necessary. Residual impacts are discussed above.

Cumulative Impacts (Alternative A)

Continued increase in recreation use of the reservoir would cause continued cumulative adverse effects to vegetation from human use around recreation facilities, use of informal trails, and general dispersed use. If the dam is raised, vegetation would be inundated around the reservoir perimeter. While most of the inundated habitats would be upland second-growth forest or maintained grassland, valuable wetland and riparian habitat would be lost in the Tanner Creek and Scoggins Creek Coves. Depending on the outcome of the dam raise plan, some elk meadows also would be inundated.

3.5.2.2 Alternative B - Minimal Recreation Development with Resource Enhancement

Alternative B has provisions similar to those of Alternative A for maintaining buffers adjacent to recreation sites. In addition, there would be beneficial effects from planting of woody species in the Tanner and Scoggins Creek riparian zones and from creating a cofferdam wetland in the Tanner Creek Cove. Any wetland creation project would be subject to hydrologic and biologic feasibility studies. Implementation of an elk management plan would have similar beneficial effects as described under Alternative A. Alternative B also includes a monitoring plan that would provide added benefits for vegetation management. Disc golf would be allowed in the Sain Creek elk meadow, but this is a minimal intrusion during the park's normal operating season and would not appreciably affect vegetation.

Beneficial effects from increased enforcement of park rules would be the same as those described under Alternative A. Re-opening Recreation Area A East as a day use area would have less effects to vegetation than its use as a camping facility under Alternatives A and C. Under Alternative B, no clearing for tent sites, RVs, or other facilities would be necessary. There would be some minor adverse effects from trampling of vegetation by users, but these would be less intense than if the area were open for camping as proposed under Alternatives A and C.

Expanded facilities at the Recreation Area A West Boat Ramp and Recreation Area C Boat Ramp would have no effects to vegetation. Addition of a board walk along the shoreline of the Scoggins Creek Picnic Area may cause the removal of some vegetation, but most of the day use area is maintained in grass. Any boardwalk would be routed to minimize removal of native vegetation, and any clearing would require planting of native vegetation as compensation according to the BMPs. There would be no effects to vegetation from the minor improvements proposed at the Sain Creek and Elks Picnic Areas.

In contrast to Alternative A, no development is proposed at the Recreation Area C Extension area. Thus, there would be no adverse effects to vegetation, and the condition of the site would not change under Alternative B. In general, the adverse effects to vegetation under Alternative B would be less than those of Alternative A.

Mitigation and Residual Impacts (Alternative B)

The implementation of Alternative B would not cause substantial adverse effects to vegetation; therefore, no mitigation measures are necessary. Residual impacts are discussed above.

Cumulative Impacts (Alternative B)

Cumulative impacts would be similar to those discussed under Alternative A.

3.5.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

The impacts from implementation of Alternative C would be similar to those described under Alternative B, except as noted in the following narrative. In addition to a cofferdam wetland at Tanner Creek Cove, Alternative C proposes constructing a cofferdam wetland at Nelson Cove in conjunction with the environmental education & research center. While creation of another wetland would offer potential benefits by increasing the habitat diversity of the park, a feasibility study would need to be conducted of the site. There is no perennial watercourse that flows into Nelson Cove so this may be a marginal site for a wetland creation project.

Development of a limited access plan could have adverse effects to vegetation, depending on the outcome of the plan. If a new spur road were required for this action, some vegetation clearing could be required. The most likely location for gated access is near the current park entrance booth, and the vegetation in this area is primarily upland grass. Clearing of any upland grass habitat for a new access would cause minor adverse effects. Any clearing of vegetation would adhere to Reclamation's BMPs that require minimizing clearing for development of new facilities.

The two-phased development for camping at Recreation Area A East would result in loss of vegetation from clearing of camping sites and picnic areas and, in phase two, for developing RV sites and group campsites. If the site were developed only to the phase 1 specifications, then the resulting adverse effects to vegetation would be slightly less than those described under Alternative A. If the site were fully developed as described through phase two, then the amount of clearing and the corresponding adverse effects to vegetation would be slightly greater than those described under Alternative A.

Moving the shoreline trail entirely off the perimeter road would require some clearing for a trail and some bridge work over ravines. The width of the new trail section would be similar to that of the existing trail. Approximately 0.5 mile of new trail would need to be cleared for this effort. Vegetation clearing

would be kept to a minimum and would represent a minor adverse effect and habitat loss. The potential horse trail upslope of the perimeter road is of greater concern because of the wider trail necessary to accommodate horses and the need to clear the entire length of new trail. Clearing vegetation for the new equestrian trail and associated parking area would result in a moderate loss of forested and shrub habitat.

Clearing of vegetation for the development of an environmental education & research center and supporting structures would cause a moderate loss of elk meadow habitat. In addition to the direct habitat loss from construction, there would be ongoing adverse effects from use of the site by overnight school groups and staff. While the development of the site would use sustainable development guidelines, effects to vegetation are unavoidable. The proponents of the environmental education & research center would be required to compensate for the loss of the elk meadow by developing habitat of similar quality and area within the park or working with Reclamation to acquire suitable replacement lands.

Developing recreation sites at the Recreation Area C Extension area would have greater effects to vegetation than those described under Alternative A. Phase one of this development would have minimal adverse effects because there would be only minimal clearing and grading required for implementation. Phase two includes doubling the available parking and adding a road connection to the existing Recreation Area C. Clearing and grading would result in the loss of some upland habitat. As described under Alternative A, most of this area is maintained as a grass field so the value of the habitat and the impact from its loss would be minimal. Design and layout of the facility would minimize the amount of native vegetation clearing necessary. In general, because of the provisions for camping at Recreation Area A East and for the construction of the environmental education & research center, implementation of Alternative C would have the greatest impact to vegetation among the three alternatives.

Mitigation Measures and Residual Impacts (Alternative C)

No substantial impacts would result from the implementation of Alternative C and no mitigation measures are necessary. Residual impacts are discussed above.

Cumulative Impacts (Alternative C)

Cumulative impacts would be similar to those described under Alternative B.

3.6 Fish and Wildlife

3.6.1 Affected Environment

The diversity of habitats within the RMP study area supports a wide variety of mammals, amphibians, reptiles, and birds. The following describes general use and occurrence of fish and wildlife populations in and around Scoggins Valley Park. Section 3.6.1.3 identifies rare and sensitive fish and wildlife species potentially occurring in the RMP study area. Section 3.6 discusses those species that are protected under the Federal Endangered Species Act (ESA).

3.6.1.1 Fish

Prior to creation of Henry Hagg Lake, game fish populations in Scoggins Creek and its tributaries were limited to cold water species. Two salmonid species in particular, the cutthroat trout (*Oncorhynchus clarki*) and steelhead (*O. mykiss*), dominated the Scoggins Creek fisheries. These two species had adapted to the freshwater habitat existing above Willamette Falls, which represented a significant fish passage barrier during low-flow summer months. Cutthroat trout native to the Scoggins Creek watershed were largely limited to the resident non-migratory form, while steelhead, anadromous (sea migrating) rainbow trout, adapted by migrating during the high-flow winter months. Both of these native cold water populations were greatly impacted by the creation of the reservoir and to fisheries changes resulting from human development. Both of these native cold water species are now afforded protected status (see Section 3.6.1.3).

Construction of Scoggins Dam significantly altered upstream fish habitat, and a warm water fishery consisting of introduced species now exists in the reservoir. Warm water species including bluegill (*Lepomis macrochirus*), yellow perch (*Perca flavascens*), largemouth bass (*Micropterus salmoides*), and smallmouth bass (*M. dolomieu*) are now a thriving fishery in Henry Hagg Lake. Table 3.6-1 lists fish species common to Henry Hagg Lake.

Upon introduction of warm water species to Henry Hagg Lake, ODFW changed their management of the reservoir to consider both trout and warm water fish (OPRD 1988). ODFW in the past stocked cutthroat trout in Henry Hagg Lake, but this practice was discontinued to preserve the genetic viability of native cutthroat populations. Currently, ODFW stocks only rainbow trout in the reservoir with 60,000 fingerling and over 100,000 legal size (8-10 inch) rainbow trout placed in Henry Hagg Lake in 2002 (ODFW 2002). As evidence of the continued viability of the warm water fishery in Henry Hagg Lake, it should be noted that the largest and second largest smallmouth bass caught in Oregon were taken from Henry Hagg Lake (ODFW 2002).

As mitigation for the loss of anadromous fish habitat resulting from the construction of Scoggins Dam, Reclamation was to fund the release of hatchery winter steelhead in the lower reach of Scoggins Creek below the dam. From 1975 to 1979, approximately 10,000 steelhead smolt were released into lower Scoggins Creek each year. However, this practice was discontinued to protect the genetic viability of native winter-run steelhead stocks (pers. comm., Caldwell, 2002). Coho salmon (*Oncorhynchus kisutch*) were also released during the period of steelhead stocking in lower Scoggins Creek. Over 700,000 coho smolt were released during the period of 1975 to 1979, resulting in a small residual anadromous run of

Table 3.6-1. Fish species common to Henry Hagg Lake.

Game Fish		
Common Name	Scientific Name	Comments
Cutthroat trout	<i>Oncorhynchus clarki</i>	Species formerly stocked in Henry Hagg Lake. Meets status criteria for rare and sensitive species. See Section 3.6.1.3 below.
Rainbow trout	<i>Oncorhynchus mykiss</i>	Species currently stocked in Henry Hagg Lake by ODFW.
Largemouth bass	<i>Micropterus salmoides</i>	Introduced, non-native species.
Smallmouth bass	<i>Micropterus dolomieu</i>	Introduced, non-native species.
Bluegill	<i>Lepomis macrochirus</i>	Introduced, non-native species.
Pumpkinseed sunfish	<i>Lepomis gibbosus</i>	Introduced, non-native species.
Yellow perch	<i>Perca flavescens</i>	Introduced, non-native species.
Non-Game Fish		
Common Name	Scientific Name	Comments
Brown bullhead	<i>Amerius nebulosis</i>	Introduced, non-native species.
Yellow bullhead	<i>Amerius natalis</i>	Introduced, non-native species.
Largescale sucker	<i>Catostomus macrocheilus</i>	
Mosquitofish	<i>Gambusia affinis</i>	Introduced, non-native species.
Speckled dace	<i>Rhinichthys osculus</i>	
Redside shiner	<i>Richardsonius balteatus</i>	
Threespine stickleback	<i>Gasterosteus aculeatus</i>	
Reticulate sculpin	<i>Cottus perplexus</i>	

Source: ODFW 1992; ODFW/USA 1995.

the species which may still contribute to the downstream fishery in the Scoggins Creek watershed (ODFW 1992). About \$30,000 of annual funding is now used for restoration efforts addressing salmonid habitat in the Tualatin River basin rather than for fish stocking.

3.6.1.2 Wildlife

Amphibian and Reptiles

Many amphibian species are likely to be found in the forested, riparian, and lakeshore areas in Scoggins Valley Park. Some of the more common species likely include the rough-skinned newt (*Taricha granulosa*), ensatina (*Ensatina eschscholtzii*), long-toed salamander (*Ambystoma macrodactylum*), western red-backed salamander (*Plethodon vehiculum*), Pacific tree frog (*Pseudacris regilla*), western fence lizard (*Sceloporus occidentalis*), and northwestern garter snake (*Thamnophis ordinoides*). Table 3.6-2 lists common reptile and amphibian species potentially occurring in the vicinity of Henry Hagg Lake based upon species range and distribution and known available habitat types in the park.

Birds

The diverse constellation of vegetative communities in Scoggins Valley offers suitable habitat for a variety of birds. Avian species common to the coniferous forests surrounding Henry Hagg Lake include the American robin (*Turdus migratorius*), Swainson's thrush (*Catharus ustulatus*), black-capped chickadee (*Poecile atricapillus*), dark-eyed junco (*Junco hyemalis*), and American crow (*Corvus brachyrhynchos*). Waterfowl species likely to be found using the open water habitat of the reservoir itself include the Canada goose (*Branta Canadensis*), mallard (*Anas platyrhynchos*), and common merganser (*Mergus merganser*). Common raptors include the red-tailed hawk (*Buteo jamaicensis*),

Table 3.6-2. Common reptile and amphibian species occurring in the vicinity of Henry Hagg Lake.

Reptiles		
Common Name	Scientific Name	Comments
Common garter snake	<i>Thamnophis sitalis</i>	Widespread and abundant.
Northwestern garter snake	<i>Thamnophis ordinoides</i>	Widespread and abundant.
Rubber boa	<i>Charina bottae</i>	Common
Western fence lizard	<i>Sceloporus occidentalis</i>	Common in dry forests and meadows
Northern alligator lizard	<i>Elgaria coerulea</i>	Less prevalent.
Amphibians		
Common Name	Scientific Name	Comments
Northwestern salamander	<i>Ambystoma gracile</i>	Common and widespread
Long-toed salamander	<i>Ambystoma macrodactylum</i>	Common and widespread.
Rough-skinned newt	<i>Taricha granulosa</i>	Common and widespread.
Ensatina	<i>Ensatina eschscholtzii</i>	Common
Western red-backed salamander	<i>Plethodon vehiculum</i>	Widespread and abundant
Pacific tree frog	<i>Pseudacris regilla</i>	Widespread and abundant.
Bullfrog	<i>Rana catesbeiana</i>	Introduced non-native species.

Source: Csuti et al. 1997.

American kestrel (*Falco sparverius*), and bald eagle (*Haliaeetus leucocephalus*). Some of the other more common species are listed in Table 3.6-3.

The only avian species affecting previous management decisions at Scoggins Valley Park is the bald eagle. Reclamation has identified seven primary bald eagle perch sites in the park. Park personnel maintain a 165-foot vegetation buffer around these perch sites and restrict construction and other potentially disturbing activities within a 0.5-mile radius of the perch sites during the months of October through May. The bald eagle is a TES species further addressed in Section 3.6.1.3 below.

Mammals

Common mammal species potentially occurring in the vicinity of Henry Hagg Lake are listed in Table 3.6-4. Most of these species are associated with the second-growth forested habitat surrounding the reservoir. None of these species have been identified as significant pest species in the park. Park management considerations pertaining to mammal species are limited to the Roosevelt elk (*Cervus elaphus roosevelti*), described below.

Approximately 50 to 80 Roosevelt elk are known to use the Scoggins Valley Park area on a year-round basis (Reclamation 1994). Typically, these elk herds move to the lower elevations around the reservoir during the winter months (USFWS 1992). As mitigation for the loss of elk grazing habitat resulting from the formation of Henry Hagg Lake, nine grassland areas (totaling approximately 140 acres) were set aside in 1974 to be managed as elk grazing meadows. These elk mitigation meadows were initially seeded with a grass-legume mixture specifically designed to encourage elk foraging. Management of the elk mitigation meadows is currently limited to yearly mowing, and non-native invasive plant species have established in limited areas in the meadows. Data on actual use of the meadows by elk are not available. The draft Elk Mitigation Plan outlines monitoring of the elk meadows to determine the use of these areas by the elk over the 10-year life of the RMP. Specifics regarding current management of elk meadows are found in Section 3.5 (Vegetation).

Table 3.6-3. Common bird species occurring in the vicinity of Henry Hagg Lake.

Common Name	Scientific Name	Comments
Pied-billed grebe	<i>Podilymbus podiceps</i>	Winter and migrant visitor.
Great blue heron	<i>Ardea herodias</i>	Nests near Henry Hagg Lake.
Mallard	<i>Anas platyrhynchos</i>	Winters in large numbers on reservoir.
Green-winged teal	<i>Anas crecca</i>	Winters in large numbers on reservoir.
American wigeon	<i>Anas americana</i>	Winters in large numbers on reservoir.
Northern pintail	<i>Anas acuta</i>	Winters in large numbers on reservoir.
Ring-necked duck	<i>Aythya collaris</i>	Winters in large numbers on reservoir.
American coot	<i>Fulica Americana</i>	Nests on Henry Hagg Lake.
Mourning dove	<i>Zenaida macroura</i>	Year-round resident.
Red-tailed hawk	<i>Buteo jamaicensis</i>	Year-round resident.
Great horned owl	<i>Bubo virginianus</i>	Year-round resident.
Rufous hummingbird	<i>Selasphorus rufus</i>	Breeding resident.
Northern flicker	<i>Colaptes auratus</i>	Year-round resident.
Hairy woodpecker	<i>Picoides villosus</i>	Year-round resident.
Stellar's jay	<i>Cyanocitta stelleri</i>	Year-round resident.
American crow	<i>Corvus brachyrhynchos</i>	Year-round resident.
Tree swallow	<i>Tachycineta bicolor</i>	Breeding resident.
Cliff swallow	<i>Petrochelidon pyrrhonota</i>	Breeding resident.
Black-capped chickadee	<i>Poecile atricapillus</i>	Year-round resident.
Bushtit	<i>Psaltirparus minimus</i>	Year-round resident.
Red-breasted nuthatch	<i>Sitta Canadensis</i>	Year-round resident.
Winter wren	<i>Troglodytes troglodytes</i>	Year-round resident.
Golden-crowned kinglet	<i>Regulus satrapa</i>	Year-round resident
Swainson's thrush	<i>Catharus ustulatus</i>	Breeding resident.
American robin	<i>Turdus migratorius</i>	Year-round resident.
European starling	<i>Sturnus vulgaris</i>	Introduced non-native pest species.
Golden-crowned kinglet	<i>Regulus satrapa</i>	Year-round resident.
Orange-crowned warbler	<i>Vermivora celata</i>	Breeding resident.
Yellow-rumped warbler	<i>Dendroica coronata</i>	Breeding resident.
Western tanager	<i>Piranga ludoviciana</i>	Breeding resident.
Spotted towhee	<i>Pipilo maculatus</i>	Year-round resident.
Song sparrow	<i>Melospiza melodia</i>	Year-round resident.
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	Year-round resident.
Dark-eyed junco	<i>Junco hyemalis</i>	Year-round resident.
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	Breeding resident.
Red-winged blackbird	<i>Agelaius phoeniceus</i>	Breeds in wetlands and shoreline habitat.
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	Year-round resident.
House finch	<i>Carpodacus mexicanus</i>	Year-round resident.
American goldfinch	<i>Carduelis tristis</i>	Year-round resident.

Source: EDAW 2002.

Table 3.6-4. Common mammal species occurring in the vicinity of Henry Hagg Lake.

Common Name	Scientific Name	Comments
Virginia opossum	<i>Didelphis virginiana</i>	Introduced species native to eastern U.S.
Townsend's mole	<i>Scapanus townsendii</i>	Common and widespread.
Little brown myotis bat	<i>Myotis lucifugus</i>	Breeding status only.
Common raccoon	<i>Procyon lotor</i>	Abundant and widespread.
Striped skunk	<i>Mephitis mephitis</i>	Widespread.
Coyote	<i>Canis latrans</i>	Widespread and abundant.
Red fox	<i>Vulpes vulpes</i>	Introduced species.
Townsend's chipmunk	<i>Tamias townsendii</i>	Associated with coniferous forest.

Common porcupine	<i>Erethizon dorsatum</i>	Widespread.
Roosevelt elk	<i>Cervus elaphus roosevelti</i>	Managed game species.
Black-tailed deer	<i>Odocoileus hemionus</i>	Managed game species.

Source: Csuti et al. 1997.

3.6.1.3 Rare and Sensitive Species

Rare and sensitive species include those species listed as Federal Species of Concern (SoC) that also have an ONHP rank of 3 or 4.

In a letter to Reclamation dated May 17, 2002, the USFWS identified Federal listed special status species that historically occurred or could potentially occur in the Henry Hagg Lake RMP study area (Appendix C). Of these species, 13 meet criteria for rare and sensitive species defined as those species with a Federal SoC listing and an Oregon Natural Heritage Program (ONHP) rank of 3 or 4. Table 3.6-5 lists the rare and sensitive wildlife species potentially occurring in the RMP study area, along with their National Marine Fisheries Service (NMFS) or USFWS, ODFW, and ONHP status. In addition, a summary of the life history and potential for occurrence in the study area for each of the 1 fish, 5 bird, and 7 mammal species meeting rare and sensitive species criteria is provided below.

Table 3.6-5. Rare and sensitive wildlife species potentially occurring in the vicinity of Henry Hagg Lake.

Species	Federal Status	Oregon State Status	ONHP Status
Fish (1)	NMFS¹	ODFW²	ONHP³
Coastal cutthroat trout, Upper Willamette ESU (<i>Oncorhynchus clarki clarki</i>)	SoC	--	4
Birds (5)	USFWS⁴	ODFW²	ONHP³
Band-tailed pigeon (<i>Columba fasciata</i>)	SoC	--	4
Olive-sided flycatcher (<i>Contopus cooperi</i>)	SoC	--	4
Yellow-breasted chat (<i>Icteria virens</i>)	SoC	SC	4
Acorn woodpecker (<i>Melanerpes formicivorus</i>)	SoC	--	4
Mountain quail (<i>Oreortyx pictus</i>)	SoC	SU	4
Amphibians and Reptiles (0)	USFWS⁴	ODFW²	ONHP³
Mammals (7)	USFWS⁴	ODFW²	ONHP³
White-footed vole (<i>Arborimus albipes</i>)	SoC	SU	4
Red tree vole (<i>Arborimus longicaudus</i>)	SoC	--	3
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	SoC	SU	4
Long-eared myotis (<i>Myotis evotis</i>)	SoC	SU	4
Long-legged myotis (<i>Myotis volans</i>)	SoC	SU	4
Yuma myotis (<i>Myotis yumanensis</i>)	SoC	--	4
Camas pocket gopher (<i>Thomomys bulbivorus</i>)	SoC	--	3

Source: USFWS 2002; ODFW 2002; ONHP 2002.

Footnotes:

¹ NMFS Listing: SoC=Species of Concern.

² ODFW Status: E= Endangered; T= Threatened; SC= Sensitive Critical- species for which listing as threatened or endangered is not imminent and can be avoided through protective measures; SP/R= Sensitive Peripheral/Rare- species that are on the edge of their range or that are naturally rare; SU= Sensitive Undetermined- species for which status is unclear.

³ ONHP Status: 1= taxa that are threatened with extinction or presumed to be extinct throughout their entire range; 2= taxa that are threatened with extirpation or presumed to be extirpated in the state of Oregon; 3= List 3- taxa for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range; 4= List 4- taxa which are of conservation concern but are not currently threatened or endangered.

⁴ USFWS Classification: SoC= Federal species of concern.

Fish

The cutthroat trout (*Oncorhynchus clarki*) is a freshwater salmonid inhabiting gravelly lowland streams, rivers, lakes, estuaries, and nearshore coastal waters (Scott & Cossman 1973). Anadromous and freshwater-restricted forms of the species exist. Although the anadromous form of coastal cutthroat trout is thought to be one of only three species of anadromous salmonids that have historically occurred above Willamette Falls (NOAA 1999), it is believed that occurrence in the Tualatin River subbasin is now largely restricted to the freshwater-migratory (non-searun) forms (ODFW 1992). The cutthroat trout population in the Willamette River and its tributaries above the falls is considered a distinct Evolutionarily Significant Unit (ESU) and is listed as a Federal SoC with an ONHP rank of 4. Scoggins Creek below the dam and all upper tributaries contributing to Henry Hagg Lake are considered spawning habitat for cutthroat trout. Henry Hagg Lake has, in the past, been stocked with cutthroat trout, though this practice was discontinued in 1986 to preserve the genetic diversity of native populations (ODEQ 2001). CWS is currently studying the fish populations of Henry Hagg Lake tributaries to determine the status and distribution of native cutthroat trout.

Birds

Band-tailed pigeons (*Columba fasciata*) are game birds occurring in the lowland coniferous and mixed deciduous-coniferous forests of Oregon (Csuti et. al. 1997). Throughout the species' range on the Pacific Coast, band-tailed pigeons are frequently associated with the presence of oaks and are subject to extensive movements, often in small flocks. The species has a Federal SoC status with an ONHP rank of 4. The species is known to nest in the densely forested stands within and surrounding the RMP study area (pers. comm., Gillson, 2002).

The olive-sided flycatcher (*Contopus cooperi*) is a relatively common songbird species inhabiting the coniferous forests of Oregon (Csuti et. al. 1997). Although the species is most abundant in open forests with substantial vertical density and available dead perching snags, it occupies a variety of forest types from sea level to subalpine environments. Olive-sided flycatchers are listed as a Federal SoC with an ONHP rank of 4. This species likely occurs where suitable habitat exists in the study area.

The yellow-breasted chat (*Icteria virens*) is a riparian-associated songbird that nests in thick brushy understory in mixed deciduous-coniferous forests and especially along the margins of streams, wetlands, rivers, and other waterbodies (Csuti et. al 1997; Ehrlich et. al. 1988). Within the study area, this species is likely to occur along the shores of Henry Hagg Lake, Scoggins Creek, and its tributaries where dense

riparian vegetation is present. It is known to nest in localized areas along the reservoir shoreline (pers. comm., Gillson, 2002). The species has a Federal SoC status and an ONHP rank of 4.

Acorn woodpeckers (*Melanerpes formicivorus*) are an oak-dependent woodpecker species occurring in Oregon in both oak savanna and oak-conifer woodland habitat (Csuti et al 1997). The species is a cooperative breeder, typically nesting in cavities in oaks or other deciduous trees. Acorn woodpeckers are a Federal SoC with an ONHP rank of 4. The USFWS identified the species as potentially occurring in the study area although their occurrence in the immediate RMP study area is unlikely without suitable oak-dominated habitat. The nearest known breeding colony is located in Forest Grove, but there are no known records for this species in the park (pers. comm., Gillson, 2002).

The mountain quail (*Oreotyx pictus*) is a ground-dwelling game bird occurring in montane and coastal coniferous forests, chaparral, and juniper woodland habitat of Oregon (Csuti et al. 1997; Ehrlich et al. 1988). It prefers open forests with a sparse overstory and ample undergrowth of brushy vegetation. The species is a Federal SoC with an ONHP rank of 4. Mountain quail have been located about 4 miles above the reservoir on Scoggins Valley Road, and they are thought to move to lower elevations nearer the reservoir during the winter (pers. comm., Gillson, 2002).

Amphibians and Reptiles

The USFWS identified three amphibian and reptile species with Federal special status listings as potentially occurring in the vicinity of Henry Hagg Lake. The more-sensitive statuses of these three species meet TES criteria. These species are addressed in Section 3.6.

Mammals

Within Oregon, the white-footed vole (*Arborimus albipes*) is generally believed to be a rare species of the Coast Range, but it is also known to occur on the Pacific side of the Cascade Mountains. Due to its rarity, relatively little is known about this small rodent. It is presumed to be a burrowing, nocturnal species favoring riparian stands of alder in coniferous forests (Csuti 1997). Suitable habitat for the white-footed vole exists in the study area, and the margins of its range extend into the vicinity of Henry Hagg Lake. The white-footed vole is a Federal SoC with an ONHP rank of 4 and an SU (Sensitive Undetermined) status with ODFW.

The red tree vole (*Arborimus longicaudus*) is one of the world's most specialized voles, subsisting on a diet limited almost exclusively to Douglas fir needles (Csuti et al. 1997). The species spends the majority of its life in the coniferous overstory, building nests of fir needles typically located over 50 feet above the ground. The red tree vole is a Federal SoC with an ONHP rank of 3. This species may occur in the fir-dominated forests around Henry Hagg Lake although the vole's presence in the study area is unknown.

Four bat species meeting rare and sensitive species criteria may occur in the study area. These include the silver-haired bat (*Lasionycteris noctivagans*), the long-eared myotis (*Myotis evotis*), the long-legged myotis (*M. volans*), and the Yuma myotis (*M. ymanensis*). All four species have a Federal status of SoC with an ONHP rank of 4, and three of the species carry a status of SU with ODFW. Because it is difficult to determine the specific status of bat species in a localized area without extensive field studies, the specific status of these species in Oregon is largely speculative. All four species are relative habitat

generalists and can be found in a variety of common forest types in Oregon. They are nocturnal, with most foraging activity focused in the early evening hours and spend days roosting in small crevices in trees, structures, and cliff faces. All four species may occur in the study area in suitable forest habitat and are likely to be found foraging above the waters of Henry Hagg Lake and associated tributaries.

The Camas pocket gopher (*Thomomys bulbivorous*) is one of three mammals endemic only to Oregon (Csuti et al. 1997). This relatively large (11.5 in.) pocket gopher is restricted to the Willamette Valley area and is thought to have persisted by readily adapting to the conversion of land for agriculture. Camas pocket gophers occur in grassy areas in the lowlands and hills and may be found in the study area in pastures, roadsides, and open agricultural land. The species has a Federal status of SoC with an ONHP rank of 3.

3.6.2 Environmental Consequences

Effects to fish and wildlife potentially resulting from the three alternatives can generally be divided into two categories: impacts potentially resulting from direct disturbance to fish and wildlife species, and those associated with the reduction or degradation of suitable habitat. Direct impacts to fish or wildlife species are typically associated with an increase – or decrease in the case of a potential beneficial impact – in the use of an area by humans. Recreation and human use patterns in Scoggins Valley Park directly affect the status, distribution, and abundance of fish and wildlife potentially occurring in the area. Increased use of the park can result in an increase in direct human-to-wildlife interactions, vehicular traffic, and noise disturbance. These effects can alter existing or historic patterns of use and occurrence of fish and wildlife.

In addition to the potential effects of direct disturbance to fish and wildlife species, potential impacts may result from alteration, degradation, or enhancement of fish and wildlife habitat. These potential habitat effects include a wide array of activities that can cause vegetation removal from construction or vehicle use, vegetation damage, and soil compaction by humans or vehicles. Direct actions and changes to human use patterns under the three alternatives may result in differential impacts to suitable fish and wildlife habitat. The potential implications to fish and wildlife under each alternative are discussed in detail below.

3.6.2.1 Alternative A – No Action, Continuation of Existing Management Practices

In addition to the continuation of current management practices at Scoggins Valley Park, this alternative includes provisions for the protection and enhancement of fish and wildlife and associated habitat. Specific actions under Alternative A that would result in beneficial impacts to species and associated habitats include: the establishment of native vegetation buffers around developed areas; implementation of a monitoring program to assess the impacts of recreation on fish and wildlife; protection of perch trees and construction timing limits to protect bald eagle habitat; development of a long-term management plan for rehabilitation and maintenance of the elk meadows; protection of bald eagle perch sites; and, targeted mitigation, as appropriate, in compensation for the installation of floating docks in the reservoir.

In comparison to the action alternatives, Alternative A incorporates only a limited amount of fish and wildlife enhancement measures. Thus, of the three alternatives under consideration, Alternative A offers the least beneficial impacts to fish and wildlife and associated habitat.

The action alternatives offer a more extensive protection and enhancement plan for the meadows with mechanisms for monitoring and the use of adaptive management to assess the effectiveness of additional enhancement actions. This decreased benefit is in part offset, however, by the fact that disc golf would not be permitted at the Sain Creek elk meadow under Alternative A.

The continued management of the native and warm water fisheries in Henry Hagg Lake would be generally similar under all three alternatives. Under each alternative, ODFW would remain responsible for fisheries management in the reservoir. In addition, under all three alternatives, suitable mitigation would be provided to compensate for the installation of floating docks and any potential associated effect to fish or fish habitat. However, the action alternatives mandate that Reclamation make a commitment to actively participate in fish habitat enhancement projects in cooperation with ODFW and local fishing clubs. These efforts toward additional fish habitat enhancement are not anticipated under Alternative A.

Alternative A also includes specific actions that may result in negative impacts to fish and wildlife and associated habitat. Specific actions under Alternative A that would result in additional developed areas within the park boundaries (and, therefore, the potential to negatively affect fish and wildlife) include: the addition of campsites, a play structure and boat dock at Recreation Area A East; the addition of recreation-associated facilities and impervious paving around Recreation Area A West; the development of trails connecting to the existing shoreline trail; additional recreational facilities and paving at the Scoggins Creek Picnic Area; paving and facilities construction at Recreation Area C; installation of a new play structure at the Sain Creek Picnic Area; and the paving of the parking area at the Elks Picnic Area. These new developed areas may negatively affect park fish and wildlife both directly through increased human disturbance and indirectly through associated habitat and water quality impacts.

The three alternatives differ substantially in their stipulated treatment of Recreation Area A East. This disparate treatment of the site could result in differential impacts to area fish and wildlife. Under Alternative A, Recreation Area A East would be further developed and opened for camping from April 1 through October 31. This is the most extensive camping season stipulated for Recreation Area A East among the three alternatives, which would likely result in the relatively larger disturbance effects to fish and wildlife.

Mitigation and Residual Impacts (Alternative A)

No formal mitigation measures are proposed for Alternative A because the actions under this alternative are not anticipated to have substantial adverse impacts on fish and wildlife in the RMP study area. BMPs listed in Chapter 5 (Environmental Commitments) are applicable under all alternatives. Residual impacts are discussed in more detail in the above narrative.

Cumulative Impacts (Alternative A)

The continued regional population growth and expected increases in recreation use at Scoggins Valley Park are likely to result in adverse effects to fish, wildlife, and associated habitat. Increased use of the park is likely to cause a concomitant increase in disturbance and trampling of vegetation; indirect adverse effects to wildlife habitat through water quality impacts (e.g., increased erosion, pollutants, run-off); direct human-wildlife interaction; and noise disturbance. While a well-formulated park management plan and efforts to control recreational use of the reservoir and surrounding lands would

reduce these impacts, cumulative adverse effects to fish, wildlife, and associated habitat would likely not be fully eliminated.

The potential dam raise would result in the large-scale loss of peripheral habitat around Henry Hagg Lake as well as the inundation of up to 80% of park recreation facilities. While the increased development and human disturbance associated with Alternative A may contribute to the cumulative impacts to fish and wildlife, regional habitat loss, and human encroachment, this contribution would be negligible compared to the loss of habitat associated with increasing storage capacity in Henry Hagg Lake.

3.6.2.2 Alternative B – Minimal Recreation Development with Resource Enhancement

Effects to fish, wildlife, and associated habitat under Alternative B would be similar to Alternative A, except where noted. In general, Alternative B includes minimal development in recreation areas, with greater habitat enhancement than Alternative A. Thus, Alternative B represents a more active plan for the management of Scoggins Valley Park fish, wildlife, and associated habitat to account for and mitigate potential adverse impacts resulting from anticipated increased recreational use and development.

The most notable difference between Alternative B and the other alternatives that would likely account for less adverse effects to area fish and wildlife is the lack of designated camping facilities. Under Alternative B, Recreation Area A East would be re-opened as a day use area; under the other two alternatives, this area would be developed to accommodate camping. The adverse impacts associated with this substantial increase in use and human disturbance would be avoided under Alternative B.

Implementation of Alternative B would result in the creation and enhancement of substantially more high quality peripheral shoreline wetland and riparian habitat for area fish and wildlife. This would principally be accomplished through the successful installation of a cofferdam at the mouth of Tanner Creek Cove. This would allow for the more consistent maintenance of the water level within the sub-impoundment regardless of water level fluctuations within the larger reservoir. The more consistent hydrologic regimen within the sub-impoundment would, in turn, allow for the successful establishment of persistent emergent wetland vegetation (e.g., *Carex* sp. and *Juncus* sp.) and dense stands of riparian vegetation (e.g., *Salix* sp., *Fraxinus latifolia*, *Alnus rubra*). As the extreme water level fluctuations in Henry Hagg Lake have resulted in a relative dearth of these habitat types, a successful wetland and riparian habitat restoration around a sub-impoundment in Tanner Creek Cove would represent a substantial benefit to park fish and wildlife afforded under Alternative B.

This alternative also has provisions for habitat restoration and enhancement in degraded riparian areas throughout the park, including the planting of woody vegetation in Scoggins Valley Park riparian zones, specifically along Tanner and Scoggins Creeks. Successful riparian habitat restoration in these areas, and in other degraded riparian corridors located throughout the park, would likely increase wildlife species abundance and diversity. Many of the rare and sensitive wildlife species described above are dependent upon the existence of healthy riparian habitat either directly as primary or foraging habitat, or indirectly to support a base of suitable prey species. The restoration of dense riparian vegetation around park streams is important to fish species (including the coastal cutthroat trout) both directly as refugia, and indirectly in the regulation of water temperature and general water quality. The successful restoration of degraded riparian habitat in Scoggins Valley Park would provide a substantial benefit to fish and wildlife populations under Alternative B.

Alternative B offers a direct benefit to area bird and bat populations through the installation of nesting/roost boxes in appropriate areas. The occurrence of bat species meeting criteria for rare and sensitive species is largely predicated upon the existence of suitable night roosting locations. Installation of bat boxes would provide additional roost sites and would increase the probability of occurrence for these rare and sensitive species. Likewise, the placement of nest boxes in suitable locations would likely increase the probability of occurrence for cavity-nesting duck species previously limited by the dearth of available nesting habitat. This action, under Alternative B, would directly benefit targeted avian and bat species.

Under Alternative B, the Sain Creek elk meadow would be minimally developed to allow disc golf. Modifications to accommodate disc golf at the Sain Creek elk meadow would include the placement of targets or baskets in the meadow and the development of an 8-car gravel parking lot. Under Alternative B, disc golf in the Sain Creek elk meadow would be limited to April 1 through October 31. Elk typically only use the mitigation meadows when they move to lower elevation areas during the winter. Thus, under Alternative B, there would not be a direct effect from increased human disturbance on the overwintering elk herds. Alternative B also would provide more substantial buffers of native vegetation to mitigate for the effect of human disturbance and provide a more secluded sanctuary for wintering elk.

In contrast to Alternative A, Alternative B includes mechanisms to more readily cooperate and coordinate with resource agencies, such as USFWS and ODFW, to monitor the status of fish, wildlife, and associated habitat and develop restoration and enhancement strategies to improve conditions for target species and populations. In regard to bald eagle protection, Alternative B includes the seasonal limitations on construction and tree removal timing provided in Alternative A, but also stipulates that Reclamation staff would actively coordinate with FWS to monitor eagle use of park lands. In regard to fisheries, like Alternative A, Alternative B mandates the continued management of the reservoir fisheries by ODFW but also stipulates that Reclamation would cooperate and coordinate with ODFW and local fishing clubs to develop strategies for the restoration and enhancement of fish habitat. If successful, the results of the monitoring, restoration, and enhancement projects stemming from these cooperative efforts provided for under Alternative B would represent a substantial benefit to area fish and wildlife populations.

In general, Alternative B would likely result in less adverse effects and more potential beneficial effects to locally occurring fish and wildlife populations than Alternative A. Under Alternative B, camping facilities would not be established in the park, resulting in a smaller increase in recreational use and accompanying human disturbance. In addition, Alternative B mandates the implementation of a diverse array of mitigating actions (e.g., native vegetation buffers, supplemental riparian planting, installation of woody debris, cooperative efforts with USFWS and ODFW, etc.) that would provide for monitoring, restoration, and enhancement of existing fish and wildlife populations and associated habitat.

Mitigation and Residual Impacts (Alternative B)

No mitigation measures are proposed for Alternative B because the actions under this alternative are not anticipated to have substantial adverse impacts on fish and wildlife in the RMP study area. Residual impacts are discussed in the above narrative.

Cumulative Impacts (Alternative B)

Cumulative impacts under Alternative B would be similar to those described under Alternative A. However, while long-term cumulative impacts associated with regional population growth and increased human disturbance in Scoggins Valley Park remain applicable under this alternative, cumulative impacts are likely to be minimized under Alternative B. Lacking the development of camping facilities, Alternative B would likely result in the smallest (or most gradual) increase in use and human disturbance at the park in comparison with the other alternatives.

3.6.2.3 Alternative C – Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

In general, Alternative C couples the increased amount of restoration and enhancement opportunities for wildlife and associated habitat provided for in Alternative B with the increased development of recreation areas prescribed in Alternative A. With the inclusion of elements from Alternatives A and B, as well as modified and additional programs and actions, it is difficult to provide a blanket assessment of the potential for the implementation of Alternative C to adversely impact or provide benefits to area wildlife relative to the other alternatives. Instead, a case-by-case review of the elements of Alternative C most likely to affect fish, wildlife, and associated habitat differentially relative to the other alternatives is provided below.

The unique treatment of Recreation Area A East under Alternative C would likely minimize the potential impacts to fish and wildlife resulting from the transformation of this former (currently closed) day use area to a camping facility. Alternative C specifies a more extensive development of Recreation Area A East compared to Alternative A. Under Alternative C, the area would be developed to support a total of 100 campsites: 50 tent sites and 50 RV sites. This amounts to a total of 30 more campsites than proposed under Alternative A. This larger proposed capacity would likely result in a more substantial increase in recreational use of the area and a commensurate increase in human disturbance effects. Initially, only 50 tent campsites would be developed in order to allow a period of time to assess the overall success of opening this area to camping. In part, this assessment would ensure that no unforeseen or undue disturbance effects would adversely impact area wildlife. The limited camping season – April 1 through Labor Day – proposed under Alternative C would also help limit disturbance effects anticipated from the opening of this area to overnight use.

Alternative C would provide the same opportunities for wildlife habitat restoration and enhancement stipulated under Alternative B (i.e., installation of nest boxes, riparian planting, native vegetation buffers, Tanner Creek Cove cofferdam wetland, etc.) and mandates the installation of a cofferdam at Nelson Cove, if feasible. Installation of a cofferdam at the mouth of Nelson Cove would create a hydrologically stable impoundment in the cove which would, in turn, provide wildlife with an increased amount of high quality peripheral shoreline wetland and riparian habitat. This action under Alternative C would afford a substantial direct benefit to park fish and wildlife populations. However, it may be determined that the seasonal hydrology of the tributaries leading to Nelson Cove may not be sufficient to support wetland and riparian habitat in this area. Under Alternative C, studies would be conducted to assess both the viability of large-scale habitat restoration project in Nelson Cove and to evaluate resultant potential beneficial impacts associated with such a project. The potential beneficial impacts afforded fish and wildlife populations through the creation of an impoundment at Nelson Cove would be largely dependent upon the success of the project: if peripheral emergent wetland and riparian habitat could be created

around Nelson Cove, this would represent a significant benefit afforded fish and wildlife under Alternative C.

Alternative C, with moderate recreation development and resource enhancement, allows for more recreational development at various locations throughout the park than is associated with the other two alternatives. As indicated in Table 2.3-1, implementation of Alternative C would result in the development of recreational facilities (e.g., campsites, shelters, parking facilities, etc.) additional to those proposed under Alternative A at Recreation Area A West, Recreation Area A East, Scoggins Creek Picnic Area, and Recreation Area C. Although the increased development proposed in each localized area under Alternative C may seem minimal, in combination, this additional development would likely result in more direct human disturbance effects and indirect adverse effects from water quality degradation on fish and wildlife under the Preferred Alternative. Even with the additional habitat enhancements included under the Preferred Alternative, implementation of Alternative C would likely increase residual direct and indirect adverse effects to fish and wildlife as compared to the other alternatives.

Under Alternative C, development of a new, independent equestrian trail would be allowed along the upper side of the perimeter road. This trail would include a staging area with parking and sanitation facilities to accommodate up to 25 vehicles. Introduction of a dedicated equestrian trail to Scoggins Valley Park would increase equestrian recreationists in the vicinity of the reservoir. This would result in an associated increase in vegetation trampling and soil compaction amounting to an increase in wildlife habitat loss and degradation. In addition, installation of the trail would increase direct disturbance impacts to fish and wildlife in areas where human disturbance was previously absent.

Park fisheries, under Alternative C as with the other alternatives, would continue to be managed by ODFW. Alternative C also would include cooperative efforts with ODFW and local fishing clubs to enhance fisheries and fish habitat also part of Alternative B. This would directly benefit park fisheries. However, as mentioned above, the increased development associated with Alternative C could result in adverse water quality impacts, which could directly affect Scoggins Valley Park fisheries. Increases in the extent of soil compaction, footprint of development, and impervious paving could result in accompanying increases in the amount of stormwater run-off and the amount of sediment and pollutants entering the watershed. In addition, Alternative C calls for the additional installation of a shoreline boardwalk at the Scoggins Creek Picnic Area and a floating restroom off of the buoy line, which could directly impact near-shore fish habitat.

In contrast to the other alternatives, Alternative C allows for the development of the Tualatin Watershed Education & Research Center at the elk meadow north of Nelson Cove. This programmatic feature represents both the largest unknown variable and, perhaps, the potential largest adverse impact to fish and wildlife under this alternative. Although sustainable design technology and building practices would be incorporated into the design of the facility complex, the development would be more extensive in concept than any current recreation facilities existing in the park. Aside from the direct impacts to habitat resulting from the extent of the construction footprint, the education & research center would likely result in a localized increase in human disturbance effects. The education & research center would be used year-round; thus, the effect of human disturbance on wildlife in the area would be extended to include times of seasonal park closure. A stipulation of allowing this development to occur is that a new elk meadow of comparable size would be created in association with the development of the education &

research center in compensation for the loss of the meadow at Nelson Cove. This may require additional land acquisition to find a land base with suitable habitat to meet the mitigation requirements.

Mitigation and Residual Impacts (Alternative C)

No mitigation measures are proposed for Alternative C because the actions under this alternative are not anticipated to have substantial adverse impacts on fish and wildlife in the RMP study area. Compensation for the development in the Nelson Cove elk meadow would be the responsibility of the project proponents. Residual impacts to fish and wildlife under Alternative C are discussed above.

Cumulative Impacts (Alternative C)

Cumulative impacts under alternative C would be similar to those described under Alternative B. However, with the largest degree of development and the inclusion of camping facilities, Alternative C would likely result in the largest increase in use and human disturbance at the park in comparison with the other alternatives. Raising the dam would inundate habitat around the reservoir, particularly wetlands and riparian habitat around Tanner and Scoggins Creeks. Loss of this habitat would have a corresponding effect to wildlife.

3.7 Threatened, Endangered, and Sensitive (TES) Species

3.7.1 Affected Environment

There are several TES species of flora and fauna potentially occurring within the RMP study area (Table 3.7-1). For this review, TES species are defined as those species with a Federal designation and an ONHP rank of 1 or 2, as well as those species with an Oregon State listing of Endangered or Threatened.

Species presence data from State and Federal sources, such as the USFWS, NMFS, Reclamation, ODFW, and ONHP, have been reviewed. In total, 20 TES species (8 plant, 2 fish, 5 bird, 2 amphibian, 1 reptile, and 2 mammal species) are known to potentially occur within the Henry Hagg RMP study area. Federal protection is afforded to those species listed or proposed as Threatened or Endangered by the USFWS under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884). ESA-related correspondence is included in Appendix C.

3.7.1.1 Plants

The following species accounts provide a general description, natural history and probability of occurrence for each TES plant species potentially occurring in the vicinity of Henry Hagg Lake.

White-Topped Aster

The white-topped aster (*Aster curtus*) is a perennial herb with unbranched stems topped by a cluster of flowering heads. It is a grassland species with a range in Oregon generally limited to vicinities around the Willamette Valley. Its native habitat of fire-maintained grassland has been significantly impacted by human development and invasion by Douglas-fir and Scot's broom (WNHP 2002). The species is a Federal SoC with an ONHP rank of 1 and is listed as Threatened by ODA. Limited amounts of suitable grassland habitat exist in the RMP study area, although there are no records for this species in Scoggins Valley Park.

White Rock Larkspur

White rock larkspur (*Delphinium leucophaeum*) is a slender perennial that grows from a cluster of bulbs. Suitable habitat for the species includes undisturbed sites on dry bluffs, open ground, and moist meadows, although it is now largely restricted to roadside ditches. It is known to occur only in Oregon only in the north Willamette Valley (WNHP 2002). There are no known records for this species in the study area. It is listed as Endangered with ODA and is a Federal SoC with an ONHP rank of 1.

Peacock Larkspur

The peacock larkspur (*Delphinium pavonaceum*) is endemic to the grassland communities of the central Willamette Valley. It is a Federal SoC and State (ODA) endangered species with an ONHP rank of 1. As the species' range is limited only to the central Willamette Valley, it is unlikely to occur in the RMP study area, although the USFWS identified the species as potentially occurring in the general study area.

Table 3.7-1. TES plant and wildlife species potentially occurring in the vicinity of Henry Hagg Lake.

Species	Federal Status	Oregon State Status	ONHP Status
Plants* (8)	USFWS¹	ODA²	ONHP³
White-topped aster (<i>Aster curtus</i>)	SoC	LT	1
White rock larkspur (<i>Delphinium leucophaeum</i>)	SoC	LE	1
Peacock larkspur (<i>Delphinium pavonaceum</i>)	SoC	LE	1
Willamette daisy (<i>Erigeron decumbens</i>)	LE	LE	1
Shaggy horkelia (<i>Horkelia congesta</i>)	SoC	C	1
Thin-leaved peavine (<i>Lathyrus holochlorus</i>)	SoC	--	1
Kincaid's lupine (<i>Lupinus sulphureus kincaidii</i>)	LT	LT	1
Nelson's checker-mallow (<i>Sidalcea nelsoniana</i>)	LT	LT	1
Fish (2)	NMFS⁴	ODFW⁵	ONHP³
Pacific lamprey (<i>Lampetra tridentata</i>)	SoC	SV	2
Steelhead, Upper Willamette River ESU, winter run (<i>Oncorhynchus mykiss</i>)	LT	SC	1
Birds (5)	USFWS¹	ODFW⁵	ONHP³
Streaked horned lark (<i>Eremophila alpestris strigata</i>)	C	SC	2
American peregrine falcon (<i>Falco peregrinus</i>)	--	LE	2
Bald eagle (<i>Haliaeetus leucocephalus</i>)	LT	LT	2
Oregon vesper sparrow (<i>Pooecetes gramineus affinis</i>)	SoC	SC	2
Purple martin (<i>Progne subis</i>)	SoC	SC	2
Amphibians and Reptiles (3)	USFWS¹	ODFW⁵	ONHP³
Northwestern pond turtle (<i>Clemmys marmorata marmorata</i>)	SoC	SC	1
Northern red-legged frog (<i>Rana aurora aurora</i>)	SoC	SV	2
Oregon spotted frog (<i>Rana pretiosa</i>)	C	SC	1
Mammals (2)	USFWS¹	ODFW⁵	ONHP³
Pacific western big-eared bat (<i>Corynorhinus townsendii townsendii</i>)	SoC	SC	2
Fringed myotis (<i>Myotis thysanodes</i>)	SoC	SU	2

Source: USFWS 2002; ODA 2002; ONHP 2002; NMFS 2002; ODFW 2002.

Footnotes:

1 USFWS Classification: SoC= Federal species of concern; LE=Listed Endangered; LT=Listed Threatened; C=Candidate taxa.

2 ODA Classification: LE=Listed Endangered; LT=Listed Threatened.

3 ONHP Status: 1= taxa that are threatened with extinction or presumed to be extinct throughout their entire range; 2= taxa that are threatened with extirpation or presumed to be extirpated in the state of Oregon; 3= List 3- taxa for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range; 4= List 4- taxa which are of conservation concern but are not currently threatened or endangered.

4 NMFS Listing: SoC=Species of Concern; LT=Listed Threatened.

5 ODFW Status: LE= Listed Endangered; LT= Listed Threatened; SC=Sensitive Critical - species for which listing as threatened or endangered is pending; SV= Sensitive Vulnerable- species for which listing as threatened or endangered is not imminent and can be avoided through protective measures; SP/R= Sensitive Peripheral/Rare- species that are on the edge of their range or that are naturally rare; SU= Sensitive Undetermined- species for which status is unclear.

Willamette Daisy

The Willamette daisy (*Erigeron decumbens*) is a Federal endangered species with an ONHP rank of 1 and ODA listing of Endangered. It is found in relatively undisturbed upland and wet prairie communities, as well as high quality prairie remnants that contain a diversity of native forb and grass species. There are recorded occurrences of the Willamette daisy near Gaston, OR (S35, T1S., R4W) in 1991. However, there have been no surveys or reported occurrences of the daisy within the park's boundary.

Shaggy Horkelia

Shaggy horkelia (*Horkelia congesta*) is a rare native herb topped with a cluster of white flowers, generally restricted to wetland prairie vegetative communities. It is a Federal SoC and State (ODA) candidate species with an ONHP rank of 1. Although the USFWS identified the species as potentially occurring in the study area, it is unlikely to exist in the park without suitable habitat.

Thin-Leaved Peavine

Thin-leaved peavine (*Lathyrus holochlorus*) is a Federal SoC with an ONHP rank of 1. It has been identified in suitable habitat of open woods and clearings in and around the Willamette Valley (ACOE 2002). This species has not been recorded in the vicinity of Henry Hagg Lake or in Washington County (ONHP 2001) although no surveys for the species have been conducted in the RMP study area.

Kincaid's Lupine

Kincaid's lupine (*Lupinus sulphureus kincaidii*) is a long-lived perennial herb of upland prairies. It is a Federal and State (ODA) Threatened species with an ONHP rank of 1. This species is notable as a host plant for the Fender's blue butterfly (*Icaria icaroides fenderi*), a Federal endangered invertebrate species. Kincaid's lupine is not known to occur in the study area and, because its range is restricted to localized areas in the Willamette Valley, the species is unlikely to occur in Scoggins Valley Park.

Nelson's Checker-Mallow

Nelson's checker-mallow (*Sidalcea nelsoniana*) is a Federal and State (ODA) Threatened species with an ONHP rank of 1. The species occurs along streams, in meadows, and in other relatively open areas such as along roadsides. There have been recorded occurrences in wetland pastures (S5, T2N, R2W) outside the park boundaries. However, no surveys have been performed for this species within the park.

3.7.1.2 Wildlife

The following species accounts provide a general description, natural history, and probability of occurrence for each TES wildlife species potentially occurring in the vicinity of Henry Hagg Lake.

Fish

Pacific Lamprey

The parasitic Pacific lamprey (*Lampetra tridentata*) is an elongate (maximum length 27 inches), almost cylindrical fish, round in cross section over half of its length to a more laterally compressed tail. There are numerous forms of this species. Anadromous populations subsist as adults by using suctorial discs (mouths) to attach to and extract fluids from typical open ocean hosts including salmon, sharks, and whales. Non-anadromous forms may or may not be parasitic, with parasitic land-locked lampreys utilizing both cold and warm water fish species as hosts (Scott and Crossman 1973).

Because Pacific lampreys are not game fish and are considered detrimental to viable commercial fisheries, their presence in freshwater systems is often overlooked. However, one of the only known commercial fisheries for this species existed on the Willamette River above the falls in the 1940s where “tons were taken annually for reduction” (Pike 1953 in Scott and Crossman 1973). A moderately strong swimming ability and capacity to cling to rocks allows this species to surmount most obstacles. The species may occur both upstream and downstream of Scoggins Dam. Little is known of this species’ abundance and distribution in the study area, although lampreys have been noted in small numbers throughout the Tualatin River Basin (Friesen and Ward 1995). Pacific lampreys are a Federal SoC with an ONHP rank of 2 and an SV (Sensitive Vulnerable) listing with ODFW.

Steelhead

Steelhead (*Oncorhynchus mykiss*) are an anadromous salmonid species distinguished from freshwater resident forms of the taxon, called rainbow trout, by their tendency to spend a portion of their life cycle in saltwater. Steelhead exhibit extreme diversity in behavior and life history, both between and among populations. Populations and even individuals within populations vary in life cycle timing, spending between 1 and 7 years in freshwater prior to smoltification; between 1 and 3 years at sea; and up to 1 year in freshwater prior to spawning. Another life history variation among steelhead is the ability to spawn more than once (iteroparity), further compounding distinction between forms of *Oncorhynchus mykiss* (NOAA 1996).

Steelhead populations are often defined by the timing of their spawning. Both summer- and winter-run steelhead populations occur in the tributaries of the Upper Willamette River. However, the summer run steelhead population was introduced to the Upper Willamette basin, with an artificial summer-run steelhead fishery maintained through annual stocking. Within the Upper Willamette Basin, the native winter-run steelhead population, which migrates back to freshwater for spawning from November through April, was thought to have adapted to the hydrologic flow regime at Willamette Falls (Howell et al. 1985). The Upper Willamette River ESU consists only of the winter-run steelhead population and is protected as Federally Threatened, with an ONHP rank of 1 and an ODFW SC (Sensitive Critical) listing. Steelhead occur in Scoggins Creek below the dam where suitable gravel-substrate spawning habitat exists. They have been restricted to the lower reaches of Scoggins Creek and the Tualatin River basin since the construction of Scoggins Dam, which represents an impassable barrier to anadromous fish.

Birds

Streaked Horned Lark

The streaked horned lark (*Eremophila alpestris strigata*) is a Federal candidate species with an ONHP rank of 2 and an ODFW SC (Sensitive Critical) listing. Although over-wintering and migratory horned larks may occur in Oregon, the protected subspecies, *strigata*, includes only horned larks known to breed in the state. Horned larks tend to nest in open areas with little or no vegetation. Suitable breeding habitat for the streaked horned lark includes agricultural areas, pastures, grasslands, sparsely vegetated shrublands, and alpine areas (Csuti et al. 1997). Although documented in Washington County and once common in the region, the streaked horned lark is now rarely seen (ONHP 2001). There are no known records for this species in Scoggins Valley Park. Although horned larks are unlikely to breed in the vicinity of Henry Hagg Lake, they could potentially over-winter in the suitable grassland habitat and unvegetated flats found in the park (pers. comm., Gillson, 2002).

American Peregrine Falcon

The American peregrine falcon (*Falco peregrinus*) is a raptor species that is specialized for capturing aerial avian prey including shorebirds, waterfowl, and songbirds (Ehrlich et al. 1988). Populations of the species were decimated by the use of DDT and other organochlorine contaminants, but recovery efforts associated with its listing as a Federal Endangered species in 1970 have allowed populations to return to near historic levels. Peregrine falcons were removed from the Federal list of Threatened and Endangered species in 1999 but remain protected as an Oregon State (ODFW) Endangered species, with an ONHP rank of 2.

In Oregon, there are over 80 known peregrine falcon nest sites with over 50 of these sites typically active during any given year (pers. comm., Pagel, 2000). Peregrine falcons build their nests, or eyres, high on inaccessible ledges, rocks, or cliffs (Csuti et al. 1997). No peregrine falcon eyres are known to exist in the vicinity of Henry Hagg Lake, and no suitable nesting habitat for the species exists within the RMP study area. However, peregrine falcons are known to occur throughout Washington County (ONHP 2001), and Henry Hagg Lake represents suitable foraging habitat for the species. This species is a regular migrant winter visitor at the Forest Grove wetlands (pers. comm., Gillson, 2002).

Bald Eagle

Bald eagles (*Haliaeetus leucocephalis*) commonly over-winter in Scoggins Valley Park. In addition, in 2002 a breeding pair of bald eagles successfully reared young in a newly established nest approximately 0.75 mile up the Sain Creek drainage from Henry Hagg Lake, approximately 0.4 mile outside the Reclamation boundary. The bald eagle is a Federal (USFWS) and State (ODFW) listed Threatened species with an ONHP rank of 2. The species is associated with coasts, rivers, lakes, and marshes where it feeds on a diet consisting mainly of fish augmented with carrion, various water birds, and small mammals (Csuti et al. 1997). The species declined in abundance and was extirpated throughout much of its range (presumably due to the effects of the use of DDT) until it received protection as a Federal Endangered species in 1967. It is assumed that over-wintering bald eagles in Scoggins Valley Park forage on Henry Hagg Lake during the day and return to communal roost sites on the forested hillside southwest of the park at night (Reclamation 1994).

Perch sites and daytime roost sites are an important habitat requirement for foraging bald eagles. Suitable perching locations include large trees over-hanging a water body and dead snags. Reclamation's 1994 *Final Environmental Assessment of Scoggins Valley Park/Henry Hagg Lake Recreation Development* identified seven primary bald eagle perch sites used by over-wintering bald eagles in Scoggins Valley Park. Park personnel maintain a 165-foot vegetation buffer around these perch sites and restrict construction and other potentially disturbing activities within a 0.5-mile radius of the perch sites from November – March.

Oregon Vesper Sparrow

The Oregon vesper sparrow (*Pooecetes gramineus affinis*) is a Federal SoC with an ONHP rank of 2 and an ODFW status of SC (Sensitive Critical). The protected subspecies, *affinis*, occurs throughout the Oregon range of the vesper sparrow, although ODFW focuses protection efforts on sensitive populations in the western interior valleys (Csuti et al. 1997). Vesper sparrows occur in open habitats such as grasslands, pastures, juniper woodlands, meadows, and agricultural lands. The species breeds in Oregon during the summer months and migrates south to central California, the southwestern United States, and Mexico to over-winter (Csuti et al. 1997). Vesper sparrows were once common in western Oregon but have nearly vanished from the region since the early part of the century (Csuti et al. 1997). This species has been reported to breed rarely in the unmanicured Christmas tree farms around the park and has been heard in the lower clearcuts around the reservoir (pers. comm., Gillson, 2002).

Purple Martin

The purple martin (*Progne subis*) is a common neotropical swallow species with a fairly continuous breeding distribution in the eastern United States but a patchy distribution with notable absences throughout the west. In Oregon, the species' breeding range is regionally localized in distinct areas, generally located west of the Cascade Mountains (Csuti et al. 1997). Purple martins are Federal SoC with an ONHP rank of 2 and an ODFW status of SC (Sensitive Critical). The species has particular breeding habitat requirements, preferring to nest in tree cavities – or nest boxes – near open areas for foraging. There is at least one known spring record for this species in the park, and purple martins are thought to occasionally nest in the forested habitat surrounding Henry Hagg Lake (pers. comm., Gillson, 2002).

Amphibians and Reptiles

Northwestern Pond Turtle

The northwestern pond turtle (*Clemmys marmorata marmorata*) is one of two freshwater turtles native to Oregon. Formerly considered a common species in the Willamette Valley area, pond turtle populations have declined by as much as 96 to 98% since the beginning of the 20th century (Csuti et al. 1997). Population declines are thought to be from both the introduction of predator species such as bullfrogs (*Rana catesbeiana*) and bass, which feast on pond turtle hatchlings, and the transformation and degradation of suitable habitat. Pond turtles prefer stagnant or slow-moving water in small lakes, ponds, rivers, and sluggish streams and require basking sites on logs, rocks, mudbanks, or cattail mats (Csuti et al. 1997).

The northwestern pond turtle is a Federal SoC with an ONHP rank of 1 and an ODFW SC (Sensitive Critical) status. The species is thought to be largely affected by extreme manipulations in water level consistent with Henry Hagg Lake management. The Western Aquatic Turtle Research Consortium (WATRC) conducted a reconnaissance survey for pond turtles and reportedly located the species within the park boundaries (Reclamation 1994). However, the ONHP database does not include any records of this species in the RMP study area, and no records of these data were located.

Northern Red-Legged Frog

The northern red-legged frog (*Rana aurora aurora*) is a native frog species that was once common to a variety of habitat types, found peripheral to ponded water west of the Cascade Mountains on the Pacific Coast. The species was once common to abundant in the Willamette Valley region. However, northern red-legged frog populations have suffered significant declines since the introduction of the non-native bullfrog, which preys heavily on red-legged frogs (Csuti et al. 1997). Several recent surveys in western Oregon have failed to detect northern red-legged frogs in localized areas where they were once commonly found.

The northern red-legged frog is a Federal SoC with an ONHP rank of 2 and an ODFW SV (Sensitive Vulnerable) status. There are no known records of occurrence for this species in the vicinity of Henry Hagg Lake. However, suitable red-legged frog habitat exists along the periphery of all slow-moving water bodies in Scoggins Valley Park, especially in those areas with dense ground cover and aquatic or overhanging vegetation.

Oregon Spotted Frog

Although once thought to be common west of the Cascade Mountains, the Oregon spotted frog (*Rana pretiosa*) may now be extirpated from the Willamette Valley region. Populations of spotted frog are only known to be extant in localized areas where non-native predatory bullfrogs do not occur. Suitable spotted frog habitat includes the waters and vegetated shorelines of ponds, springs, marshes, and slow-moving streams. The species tends to prefer cool, permanent, quiet water bodies with a benthic layer of dead and decaying vegetation (Csuti et al. 1997).

The Oregon spotted frog is a Federal candidate species with an ONHP rank of 1 and an ODFW status of SC (Sensitive Critical). There have been documented occurrences of the spotted frog in the Gales Creek area (USFWS 1993). However, there have been no recorded occurrences of the frog in the Scoggins Valley Park area (ONHP 1993). Given the dramatic declines in populations of this species, spotted frogs are unlikely to occur in the RMP study area although suitable habitat exists in the park.

Mammals

Pacific Western Big-Eared Bat

The Pacific western big-eared bat (*Corynorhinus townsendii townsendii*) is a rare but relatively well-studied bat species occurring in localized regions of the state of Oregon. The species' occurrence is thought to be limited by the presence of suitable roost sites, which include buildings, caves, mines, and bridges (Csuti et al. 1997). Big-eared bats are very intolerant of human disturbance, in part accounting for their spotty distribution throughout the state. Confirmed range for this species in Oregon is often

thought to be limited to localized areas around known roost sites, predominantly in the southwestern part of the state, although ONHP has documented the occurrence of the Pacific western big-eared bat in Washington County (ONHP 2001). No known roost sites have been identified within the RMP study area, and no known records of occurrence exist for this species in Scoggins Valley Park. The Pacific western big-eared bat is a Federal SoC with an ONHP rank of 2 and an ODFW status of SC (Sensitive Critical).

Fringed Myotis

The fringed myotis (*Myotis thysanodes*) is a rare bat species occurring in Oregon west of the Cascade Mountains and in localized areas in the northeast of the state. The species is most common in southwestern Oregon where it is known to breed at Oregon Caves National Monument. Fringed myotis may occur in a wide variety of habitats but seems to prefer forested or riparian areas (Csuti et al. 1997). The species is a Federal SoC with an ONHP rank of 2 and an ODFW SU (Sensitive Unknown) status. There are no known records of occurrence for the fringed myotis in the study area, although suitable habitat exists in and around the park.

3.7.2 Environmental Consequences

None of the TES plant species identified as potentially occurring in the RMP study area have been located in the park. Local populations of Willamette daisy and Nelson's checker-mallow have been identified in the region, and – of the TES plant species described above – these species likely have the highest potential for occurrence in the RMP study area. Activities that result in the loss or degradation of wetland meadow habitat could affect these species, but the occurrence of any of the TES plant species identified above is doubtful. Because no formal surveys for TES plant species have been conducted within the park boundaries, preconstruction surveys would be conducted under all alternatives to ensure that facility development would not affect TES plant species.

Potential effects to TES wildlife species resulting from RMP implementation would be similar to those identified for general wildlife as described in Section 3.6.2 above. However, aside from the bald eagle, a year-round resident in the vicinity, the TES wildlife species identified above are likely to have an incidental status in the RMP study area. The most typical potential effect to these species resulting from RMP implementation would be to further limit a species' potential for occurrence in the park.

The Pacific lamprey, American peregrine falcon, Oregon vesper sparrow, purple martin, northwestern pond turtle, and Oregon spotted frog have all been detected in the general vicinity of the study area, although their actual occurrence in the park may be limited in number or to only an occasional status. Steelhead occur only in Scoggins Creek and the larger Tualatin River sub-basin downstream of Scoggins Dam. Potential effects to this fish species would be limited to indirect impacts resulting from changes in water quality. The streaked horned lark, northern red-legged frog, Pacific western big-eared bat, and fringed myotis have not been documented in the RMP study area, although they could potentially occur in existing suitable habitat located within the park. Effects to all potentially occurring TES plant, fish, and wildlife species resulting from RMP implementation are identified below where they specifically differ from those identified for general wildlife in the previous chapter.

3.7.2.1 Alternative A – No Action - Continuation of Existing Management Practices

Alternative A and the action alternatives include provisions for the protection of bald eagles. Under all alternatives, construction and tree removal activities within the park would be limited to between March 31 and October 31 to minimize disturbance to wintering bald eagles. In addition, under all alternatives, identified eagle perch sites would be protected. These measures would directly benefit bald eagles. However, the benefits to this species would be most limited under Alternative A. Under the action alternatives, additional benefits would be afforded eagles through the implementation of cooperative programs with the USFWS to monitor eagle use on Reclamation lands. These cooperative monitoring programs are not mandated under Alternative A. The eagle nest outside Reclamation land is almost 1 mile from the closest recreation site – the Sain Creek Picnic Area. This is a small site with minimal use. Given the distance from the nest site, no disturbance effects are anticipated.

Under Alternative A, the control of noxious weeds in the park would be accomplished according to Washington County ordinances, whereas under the action alternatives an Integrated Pest Management Plan specific to Reclamation land would be developed and implemented. The control of invasive noxious weeds would increase the potential for establishment of native plant species, directly benefiting TES plant species. With a comprehensive, site-specific Integrated Pest Management Plan, this benefit would be maximized under the action alternatives as compared to Alternative A.

Compared with the other two alternatives, a moderate amount of new development is proposed under Alternative A. In general, implementation of Alternative A would result in more new development than Alternative B, but less than proposed under Alternative C. This would likely result in relatively commensurate levels of human disturbance, habitat loss and degradation, and adverse water quality impacts. These potential impacts would serve to limit the occurrence of TES species known to occur in the RMP study area and further minimize the probability of occurrence for those potentially occurring species not previously detected in the vicinity of the park. The general adverse effects to TES species associated with development would be less under Alternative A than Alternative C, but likely more than Alternative B.

The beneficial effect to TES species of increased water quality and erosion/sedimentation control programs would be minimized under Alternative A. Under the action alternatives, additional cooperative measures to improve water quality upstream of the reservoir would be implemented. This would afford a direct benefit to Pacific lamprey and winter-run steelhead and indirectly benefit all TES species by enhancing aquatic ecosystems in the park. The peregrine falcon, bald eagle, purple martin, pond turtle, red-legged frog, spotted frog, and both TES bat species all rely upon aquatic habitat as either primary or foraging habitat. The benefit to these species of increased water quality protection actions would be minimized under Alternative A.

The open grasslands of the elk meadows offer suitable habitat for all the TES plant species described above and for the streaked horned lark and Oregon vesper sparrow. Under all alternatives, the total acreage of area maintained as elk meadow would be increased from the existing 110 acres to 140 acres, directly benefiting these TES species. Improved management of the meadows, stipulated under all alternatives, would reduce the presence of non-native invasive weed species, although it is uncertain how the tilling of the soil every 7-10 years would affect the potential for establishment of native TES plant species. In addition, a minor benefit would be afforded grassland-associated TES species under

Alternative A because disc golf, and the associated adverse effects of human disturbance, would not be permitted in the Sain Creek elk meadow.

Implementation of Alternative A would have no adverse effects on Federally listed or proposed threatened or endangered species.

Mitigation and Residual Impacts (Alternative A)

No mitigation measures are proposed under Alternative A. Residual impacts are previously discussed in more detail in the above narrative.

Cumulative Impacts (Alternative A)

Continued increases in recreation use could affect TES plant and wildlife species. Increased human disturbance around grassland habitat could further reduce the probability of occurrence of the eight TES plant species identified above and restrict the occurrence of streaked horned larks and Oregon Vesper sparrows. Increased use of shoreline, wetland, and riparian habitat could potentially affect the occurrence of Pacific lamprey, peregrine falcon, bald eagle, purple martin, pond turtle, red-legged frog, spotted frog, big-eared bat, and fringed myotis species. The cumulative effect of adverse water quality impacts resulting from increased use of the park could affect downstream populations of winter-run steelhead. These potential cumulative adverse effects to TES species would be negligible in comparison with the large-scale habitat loss that would be associated with the raising of Scoggins Dam and the inundation of habitat peripheral to the reservoir.

3.7.2.2 Alternative B - Minimal Recreation Development with Resource Enhancement

General adverse effects to TES species under Alternative B would be less than those anticipated under Alternative A due to the less extensive development and more comprehensive habitat mitigation and enhancement measures planned under Alternative B. Impacts to specific TES species under Alternative B would be the same as those described under Alternative A, except as noted below.

Under both action alternatives (Alternatives B and C), nest and roost boxes for birds and bats would be placed in suitable locations throughout the park. This could directly benefit the two TES bat species and the purple martin. It is thought that the occurrence of bat species, notably the Pacific western big-eared bat, is largely predicated upon the existence of suitable roosting structures (Csuti et al. 1997). The presence of bat boxes would increase the probability of occurrence for these two species. Scoggins Valley Park lies within the purple martin's West Coast breeding range. The presence of suitable nest boxes for this cavity-nesting species may allow breeding pairs to take up residence in the park during the summer.

As opposed to Alternative A, under Alternative B (and Alternative C), a park-specific Integrated Pest Management Plan would be developed and implemented to control non-native invasive noxious weed species. This plan would be more comprehensive and site-specific than weed control measures implemented in accordance with Washington County ordinances under Alternative A. This would likely improve control of invasive non-native species, especially in grassland communities overrun by infestations of non-native blackberry and Scot's broom. Such a comprehensive plan would increase the

probability of the establishment of TES plant species, affording an increased benefit to these species under Alternative B.

Under the action alternatives, a greater benefit to bald eagles would result from the implementation of cooperative programs with the USFWS and Reclamation to monitor eagle use in the vicinity of the park. It is anticipated that such programs could be used to identify potential impacts resulting from park management and use. Reclamation would then work in cooperation with the USFWS to use techniques of adaptive management to formulate suitable mitigation strategies for any noted adverse effects.

As mentioned above, significantly less recreational development is slated under Alternative B. This would result in proportionately less impacts to all identified TES species. In particular, reduced habitat degradation from the adverse effects of human disturbance – vegetation trampling, soil compaction, etc. – would increase the probability of the establishment of TES plant species. Decreased disturbance in terrestrial habitats would benefit the streaked horned lark, Oregon vesper sparrow, and purple martin. The minimization of associated adverse water quality effects would benefit lamprey, steelhead, and those TES species dependent on aquatic ecosystems, including bald eagle, peregrine falcon, pond turtles, red-legged frog, and spotted frog. Most notably, the exclusion of the development of campsites under Alternative B would reduce human disturbance and noise effects at night, benefiting the two nocturnal TES bat species.

As opposed to Alternative A, the two action alternatives call for riparian and instream enhancement measures. Under Alternative B, woody vegetation species would be planted in riparian habitat in the vicinity of the park. In addition, instream woody debris would be installed in tributaries upstream of the reservoir. This would improve water quality, which would directly benefit lamprey and steelhead, identified TES amphibian and reptile species, as well as those TES bird and bat species utilizing shoreline aquatic areas as foraging habitat.

The large-scale habitat restoration associated with the installation of a cofferdam at the Tanner Creek Cove would offer a direct benefit to TES species not provided under Alternative A. Under Alternative B, the mouth of the Tanner Creek Cove would be dammed to create an upstream impoundment with restored peripheral emergent wetland and riparian habitat. This could increase suitable habitat for the red-legged frog and Oregon spotted frog. This wetland restoration would also benefit resident and downstream fish species, including the lamprey and steelhead, through associated water quality improvements. The benefits afforded TES species through the restoration of wetland and riparian habitat at the mouth of Tanner Creek would not be associated with implementation of the No Action Alternative.

Implementation of Alternative B would have no adverse effect on Federally listed or proposed threatened or endangered species.

Mitigation and Residual Impacts (Alternative B)

No mitigation measures are proposed under Alternative B. Residual impacts are previously discussed in the above narrative.

Cumulative Impacts (Alternative B)

Cumulative impacts under Alternative B would be similar to those described under Alternative A.

3.7.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement

Alternative C calls for more new recreation development than any other alternative. In general, this would result in the largest detrimental effect to TES species among all alternatives. However, Alternative C also includes the most provisions for habitat restoration and enhancement. These actions would benefit TES species and offset the adverse impacts of the increased development and associated disturbance. Impacts to specific TES species under Alternative C would be similar to those associated with Alternative A, except as noted below.

Under Alternative C, specific actions to preserve and protect the wintering bald eagle population would be similar to those associated with Alternative B. The cooperative programs to monitor and identify potential impacts to bald eagles included under the action alternatives would benefit this TES species.

Similar to Alternative B, Alternative C calls for Reclamation to work with ODFW on fish habitat enhancement projects in Henry Hagg Lake and associated tributaries. Potential specific fish habitat enhancement projects have yet to be identified, but it is presumed these efforts would focus primarily on improving habitat in the reservoir. However, if fish habitat enhancement projects are implemented in Scoggins Creek downstream of the dam, this would directly benefit both Pacific lamprey and winter-run steelhead populations. In addition, these species would indirectly benefit from instream and reservoir fish habitat enhancement projects from potential associated water quality improvements.

As with Alternative B, implementation of Alternative C would include the development and use of an Integrated Pest Management Plan to control noxious weeds, especially in and around the elk meadows. This would result in the same benefit to TES plant species associated with the implementation of Alternative B.

Like Alternative B, Alternative C includes provisions for the installation of nest and roost boxes in appropriate locations throughout the park. This would provide a direct benefit to purple martin and the two TES bat species. The No Action Alternative does not include provisions for this habitat enhancement measure.

Alternative C includes the same provisions for enhancement of riparian habitat, aquatic habitat, and water quality included under Alternative B. As described in Section 3.7.2.2 above, the planting of woody vegetation in riparian habitat and installation of instream woody debris in tributaries above the reservoir would benefit TES fish, bat, amphibian, and reptile species, as well as the peregrine falcon, bald eagle, and purple martin. In addition, like Alternative B, Alternative C mandates the installation of a cofferdam at the mouth of Tanner Creek Cove. The same benefits to TES species associated with this large-scale habitat restoration described under Alternative B would be provided through the implementation of Alternative C.

Distinct to Alternative C is the installation of a cofferdam at the mouth of Nelson Cove. This would create a hydrologically stable impoundment in Nelson Cove where high quality emergent wetland and riparian habitat could become established. This would provide additional benefits to TES species, similar to those associated with the proposed wetland and riparian habitat restoration at Tanner Creek Cove.

Specifically, the creation of an impoundment in Nelson Cove would provide additional primary habitat for TES reptile and amphibian species, and additional foraging habitat for the peregrine falcon, bald eagle, purple martin, and the two TES bat species. This additional suitable habitat would obviously provide additional benefits to these TES species. In addition, creation of a healthy wetland/riparian complex in Nelson Cove would likely improve water quality, which would benefit Pacific lamprey and winter-run steelhead. Because there is no perennial water course flowing into Nelson Cove, a thorough study would be conducted to determine the feasibility of this project.

Also distinct to Alternative C is provisions for the creation of an equestrian trail aligned outside of the perimeter road with an associated staging/parking area to accommodate up to 25 vehicles. The elimination and degradation of native habitat would directly impact terrestrial TES wildlife species and result in additional adverse effects to water quality that could indirectly affect TES fish and wildlife using aquatic and shoreline habitat. In addition, disturbance of native habitat and the trampling of vegetation and compaction of soil associated with the equestrian trail and horseback riding would further decrease the probability for identified TES plant species to become established in the RMP study area.

As mentioned above, Alternative C calls for the most extensive amount of new development of the three alternatives. Significantly, Alternative C authorizes the development of the Tualatin Watershed Education & Research Center. This specific development, as well as more extensive recreation facilities planned at Recreation Area A East and West, the Scoggins Creek Picnic Area, and Recreation Area C and the adjacent cove, increases the overall footprint of developed/disturbed areas. This would adversely impact TES plant species by further reducing the probability of recruitment of these species in the park. Associated with this increased development is a proportionate increase in deleterious effects to TES wildlife through habitat loss and degradation and increased human disturbance effects. In addition, the increased development could indirectly affect resident and downstream TES fish species, Pacific lamprey, and winter-run steelhead, through an increased degradation of water quality. Implementation of BMPs would minimize but not eliminate this risk.

Implementation of Alternative C would have no adverse effect on Federally listed or proposed threatened or endangered species.

Mitigation and Residual Impacts (Alternative C)

No mitigation measures are proposed under Alternative C. Residual impacts are previously discussed in more detail in the above narrative.

Cumulative Impacts (Alternative C)

Cumulative impacts associated with Alternative C would be similar to those described under Alternative A.

3.8 Recreation

3.8.1 Affected Environment

Henry Hagg Lake and the surrounding Scoggins Valley Park are located in northwest Oregon, approximately 30 miles southwest of Portland near the city of Forest Grove in Washington County. The reservoir levels are controlled by TVID; however, since 1973, all operations and maintenance of the recreation facilities at the reservoir have been managed by Washington County. Lands owned by Reclamation at Henry Hagg Lake total approximately 2,581 acres, including approximately 1,132 surface acres and 11 miles of shoreline (Titre and Ballard 1999). Henry Hagg Lake rests at the base of Oregon's Coastal Range and offers a variety of recreational facilities and activities.

Washington County is in an area serviced by Metro, a regional government that serves three adjacent counties and 24 cities in the Portland, Oregon metropolitan area. Metro's Regional Parks and Greenspaces Department operates 21 regional parks and natural areas. Only one of Metro's facilities, Blue Lake Regional Park, is similar to Henry Hagg Lake; however, Blue Lake itself is only 64 surface acres. Approximately 15 miles west of Portland, Blue Lake Regional Park provides opportunities for boating, fishing, picnicking, swimming, and special events. Surrounding counties also provide numerous recreation facilities close to the Portland metropolitan area. Most of these facilities, however, are associated with one of the many large rivers in the area (e.g., Columbia River) and provide a somewhat different recreation environment than found at Henry Hagg Lake. Nonetheless, these facilities provide similar recreation opportunities such as boating, picnicking, swimming, and fishing. Nearby, in Washington State, Vancouver-Clark Parks & Recreation Department is a significant recreation provider for the city of Vancouver and Clark County. The department operates three parks (Vancouver Lake Park, Salmon Creek Park, and Lacamas Lake Park) that are somewhat similar to Henry Hagg Lake, although these parks are much smaller in size (200-400 acres) and, unlike at Henry Hagg Lake, motorized boats are not permitted (Vancouver-Clark Parks & Recreation Department 2002). Overall, due to its large size, Henry Hagg Lake is a unique recreation facility in the Portland metropolitan area.

3.8.1.1 Recreation Facilities

Existing recreation facilities at Henry Hagg Lake/Scoggins Valley Park are located in five primary areas: Recreation Area A West, Scoggins Creek Picnic Area, Recreation Area C, Sain Creek Picnic Area, and Elks Picnic Area. A sixth area, Recreation Area A-East, was closed in 1989 due to vandalism and other security concerns. Recreation Area A West, Recreation Area A East, and Recreation Area C were developed by Reclamation as part of the original reservoir project; subsequently, Elks Picnic Area, Sain Creek Picnic Area, and Scoggins Creek Picnic Area were developed by Washington County with subsidized funding from Reclamation. Table 3.8-1 lists existing recreation facilities found at each of these areas.

As previously stated, the reservoir is divided almost equally into two sections by a buoy line. On the north end of the reservoir, a no-wake rule is enforced, while the south end has a 35 mph speed limit. This division has some effect on the type and level of activities occurring at the different recreation facilities. In general, the boat ramp at Recreation Area A West is used predominantly by recreational motor boaters and for PWC use, while the boat ramp at Recreation Area C gets more use by anglers, sail boaters, and other no wake or non-motorized boaters. Other uses at these two facilities include

Table 3.8-1. Overview of existing recreation facilities at Henry Hagg Lake

		Recreation Areas						Total
		Recreation Area A West	Recreation Area A East	Recreation Area C	Sain Creek Picnic Area	Scoggins Creek Picnic Area	Elks Picnic Area	
	Facility							
Access & Parking	Road Access (Paved/Gravel)	P	P	P	P	G	G	
	Interior Circulation	P	P	P	P	G	G	
	Car Parking Spaces	38	129	146	104	Undefined	Undefined	417
	Boat Trailer/Car Parking	61		166		Undefined	Undefined	227
	Boat Ramps (lanes)	3		3				6
	Courtesy Docks	1		2				3
	Fishing Docks			1				1
Day Use Areas & Facilities	Picnic Sites - Single Units	22		46	34	15	10	127
	Group Picnic Shelters			1	2			3
	Trails/Paths	*		*		*	*	
	Informal/Interpretation							
Support Facilities	Flush Restrooms, 2-Unit						1	1
	Flush Restrooms, 4-Unit							0
	Flush Restrooms, 6-Unit	2	3	2	1			8
	Portable Toilets, 1-Unit					1		1
	Sinks	8	12	8	4			32
	Potable Water	*	*	*	*	*	*	
	Electrical Hookups			*	*			
	Maintenance/Storage Facilities	*						
Other	Disabled Persons Facilities	*	*	*	*	*	*	*

*Indicates existence of facility, but number not relevant or known.

Source: Washington County Parks 2002

picnicking and shore fishing. Recreation Area C has more picnic tables, a larger area available for shore fishing, and receives more group and family use than Recreation Area A West. Almost all of the reservoir's shoreline is accessible for swimming; however, there are no designated swimming areas or lifeguards.

Henry Hagg Lake/Scoggins Valley Park has two concessionaires, both operating daily and located at Recreation Area C. Rogol's Recreational Rentals has been operating at Henry Hagg Lake since 1991

and rents out a variety of boats including paddleboats, rowboats, electric motorboats, canoes, and kayaks. Motorboats are rented on an hourly (\$12/hour) or daily (\$40/day) basis. Kayaks, canoes, and paddleboats are also rented by the hour (\$8) or all day (\$30). The concessionaire is open daily from opening day through Labor Day. In 2002, the concessionaire paid a fee of \$2,800 to operate at the park. The County is in the process of extending this concessionaire's contract for another 5 years (pers. comm., C. Wayland, 2002). The other concessionaire is a mobile food stand, called Lunch Express, that has been operating in the park since 1999. They serve a variety of food and beverages and are currently operating under a 3-year contract that expired in October 2002. The concessionaire paid a fee of \$3,600 to operate at the park for the 3-year period. Park staff indicated that there has never been any type of problems or complaints with either of the concessionaires (pers. comm., Wayland, 2002). New, 3-year-long concession contracts have been developed for the two concessions.

Recreation Area A West is a 2-acre site located just past the entrance to Scoggins Valley Park. The site provides picnic tables, a large barbecue, potable water, a restroom, and boat launch. The boat launch has an 800-foot long concrete ramp with three lanes as well as a dock. The picnic area located on a hillside above the boat launch is accessible to persons with disabilities (accessible). By providing visual and physical separation from the boat launch and parking area, this site provides a quiet, somewhat secluded area for picnicking away from the noise and activity of the boat and vehicle traffic. The picnic area has 22 single-unit picnic sites, as well as a small group area with six tables.

Recreation Area A East is a 25-acre site that is densely wooded and has parking, three restrooms, and a picnic area. Under the direction of the 1994 NEPA EA, this area was to be opened for camping. It was used as a day use area but was indefinitely closed in 1989 because of public safety concerns prompted by vandalism and parties. Since then, WACO has conducted selective timber harvesting and clearing of nearly all underbrush to more easily view the site for enforcement and in anticipation that the site would be reopened as a day use or camping area under the direction of the RMP.

Scoggins Creek Picnic Area is a 2-acre site with a gravel parking area and 15 picnic tables and barbecue grills. Other facilities include one portable toilet and two trash receptacles. The site is located in a shaded spot on the northwest tip of the reservoir where Scoggins Creek flows into the reservoir and provides direct access to the creek for wading or fishing. This site is less developed than the others and has more of a natural and secluded character. There is moderate erosion and vegetation damage along the creek bank due to a combination of fluctuations in the creek's water level and the impacts of footpaths leading to the creek bank.

Recreation Area C is a 38-acre site on the west side of Henry Hagg Lake. Facilities at this site include a boat launch, an accessible fishing pier completed in 2000, a covered group picnic area, and restrooms. The group picnic area, known as The Pavilion, is a large covered, open air picnic structure adjacent to the parking area above the boat ramp. It is accessible and provides 24 picnic tables, six serving tables, two large barbecue grills, and water and electricity hook-ups. The Pavilion overlooks the west end of Henry Hagg Lake, offering good water views and easy access to the shoreline. The site is typically reserved for large group events and can accommodate groups of up to 800 people. In addition to the group picnic area, there are 46 individual picnic sites set in a large grassy area with scattered groups of shade trees. The fishing pier is a large, well-built structure situated away from the boat launch near the individual picnic sites. The boat launch has three lanes, two docks, and is approximately 800 feet long.

The docks operate on a rail and cable system that is often difficult to operate and monitor with water fluctuations.

Sain Creek Picnic Area is a 6-acre site located in a small cove at the confluence of Sain Creek and Henry Hagg Lake just south of Recreation Area C. The site has newer, attractive facilities overlooking the reservoir among a large grassy area and several groups of large, mature trees. This site has two group picnic areas, as well as 34 individual picnic sites. The larger group picnic area, known as Torvend Pavilion, is covered and provides 12 picnic tables, two serving tables, electrical outlets, concrete counters and sink, and a stove flume. The accessible site is typically reserved for large group events and can accommodate groups of up to 250 people. The smaller group area provides six tables and two serving tables. Sain Creek Picnic Area overlooks the west end of Henry Hagg Lake, offering good water views and easy access to the shoreline when the water levels are high. Other facilities include benches, restrooms, and drinking fountains.

Elks Picnic Area is a 6-acre site on the south end of the reservoir close to the dam. As the site is adjacent to the dam face, it is a popular bank fishing spot. This site provides fishing access, 10 picnic tables, 4 benches, and restrooms. At one time, this site provided an accessible fishing elevator; however, wave action eroded the bank and the elevator was decommissioned. The fishing pier at Recreation Area C was built to replace this one. This site appears largely as a gravel parking area; however, there is a large wooded area adjacent to the fishing access trail and restroom.

In addition to these facilities, Henry Hagg Lake features an easy to moderate, 15-mile shoreline trail referred to as the Master Trail. This trail offers hiking, bicycling, and wildlife viewing opportunities. It has a natural surface, with some roots and rocks, and varies in width. Volunteer groups perform periodic litter and debris clearing as well as minor regrading, while the County does vegetation clearing to maintain an unobstructed trail corridor. There are several pull-offs from the reservoir's perimeter road that provide access to short access trails leading to the Master Trail. The Master Trail utilizes the reservoir's perimeter road shoulder in three areas where there are no trail segments along the shoreline. These areas are located at Scoggins Creek, Sain Creek, and across the dam. The perimeter road shoulder is utilized in these and several other areas because the shoreline has either washed out or eroded. In these cases, trail users use the access trails up to the perimeter road and utilize the road shoulder until the next access trail. The perimeter road shoulder provides a 10.5-mile long, 8-foot wide signed bicycle lane, maintained by the Washington County Department of Land Use and Transportation.

3.8.1.2 Recreation Activities and Use Levels

Henry Hagg Lake/Scoggins Valley Park is currently used solely for day use activities. Water-based recreation activities are most prevalent; however, land-based activities are also popular and attract many visitors (Titre and Ballard 1999). Outdoor recreation activities include boating, fishing, swimming, water-skiing, picnicking, wildlife viewing, hiking, and bicycling. Equestrian use is not currently allowed in the park. Annual visitation figures for Henry Hagg Lake for the period between 1990 and 2001 are provided in Table 3.8-2.

The original recreation development plan for Henry Hagg Lake, completed in 1970, projected that visitor recreation days would reach 500,000 within 10 years of initial development (NPS 1970). Estimated visitation figures shown in Table 3.8-1, however, indicate that visitor recreation days had not reached this projected number in 1990, 20 years after initial development. In 2002, annual attendance grew

Table 3.8-2. Annual attendance at Henry Hagg Lake.

Year	Annual Attendance	Percent Change in Annual Attendance from the Previous Year
1990	457,266	N/a
1991	459,295	0.4 percent
1992	488,207	6.3 percent
1993	486,119	-0.4 percent
1994	591,272	21.6 percent
1995	633,449	7.1 percent
1996	700,382	10.6 percent
1997	687,954	-1.8 percent
1998	670,052	-2.6 percent
1999	617,912	-7.8 percent
2000	599,656	-3.0 percent
2001	456,175	-23.9 percent
2002	706,000	54.8 percent

Source: Washington County Parks 2001-2002

considerably; however, much of this growth can be attributed to extending the recreation season by 3 months, which was done in 2002. The new recreation season is March through November. Overall, there has been a trend of increasing annual attendance over the years. Attendance grew to 706,000 in 2002, which is a park record. Attendance from the mid-1990s until the present has fluctuated primarily due to wet or dry conditions (i.e., 1994 through 1998 were generally wet years resulting in a full reservoir; conversely, 1998 through 2001 were dry, low pool years).

Entry into Henry Hagg Lake/Scoggins Valley Park requires either a daily or seasonal pass for both vehicles and boats. Daily passes are available for purchase at the park entrance fee booth. A 2002 vehicle daily pass was \$4.00, while a vehicle with boat daily pass was \$5.00. Season passes are also available. Beginning in 2002, the recreation season was extended from the first weekend in March through November 24th. These dates correspond with the fishing season set by ODFW; prior to 2002, the recreation season opened the last weekend in April and closed October 31st. Approximately 120,000 recreation visitor days were recorded during March and April of 2002, indicating a strong demand during this time of year for the recreation facilities provided at Henry Hagg Lake. Season passes, which allow multiple park visits during the season, are available at several retail outlets throughout the Portland area. Season passes are sold in the following increments: vehicle pass, \$35; boat pass, \$40; and senior citizen pass, \$30 (boat or vehicle). No senior citizen rates apply to daily passes. Either a daily pass or season pass must be displayed while visiting the park.

In 1999, a survey of recreation users at Henry Hagg Lake was administered, with a sample size of 360 (Titre and Ballard 1999). Survey results provide useful information regarding visitor profiles and perceptions of the park and its facilities. The results of these completed surveys are the basis for the visitor information presented below. However, the sample size is small and provides only a limited view of park user perspectives.

The 1970 Recreation Development Plan for Scoggins Reservoir concluded that “recreation values of Scoggins Reservoir will be primarily of local significance” (NPS 1970). The 1999 Recreation User Survey provided information that supports this early projection by asking respondents the location of

their primary residence. As shown in Table 3.8-3, 76% of respondents were from the nearby communities of Hillsboro, Beaverton, Portland, and Forest Grove. The remainder of visitors were from a variety of other communities.

Table 3.8-3. Location of primary residence of visitors to Henry Hagg Lake.

Location of Primary Residence	Percent
Hillsboro	23%
Beaverton	21%
Portland	19%
Forest Grove	12%
Other communities	25%
Total	100%

Source: Titre and Ballard 1999

These numbers are supported by the fact that most visitors (97%) traveled from less than 50 miles and that the close, convenient location of the park was the feature respondents listed most (23%) when asked what they liked best about the park. These numbers suggest that Henry Hagg Lake largely serves as an easily accessible recreation facility for nearby residents.

The Recreation User Survey asked respondents to indicate all of the types of recreation activities they participated in while visiting Henry Hagg Lake. ODFW stocks the reservoir with fingerling and catchable rainbow trout. The reservoir is also home to large and small mouth bass, yellow perch, and bullhead, which have established self-reproducing populations. The reservoir is known as one of the premier fishing lakes in Oregon; therefore, it is not surprising that fishing was the activity most participated in by park users (47%). The popularity of fishing at Henry Hagg Lake is further supported in that fishing boats were the most common boat type in use on the lake (43%). As noted in Table 3.8-4, other popular activities include picnicking, boating, and a variety of other activities. While nearly half of the park users participate in fishing, this wide range of numbers indicates that the park provides numerous outdoor recreation opportunities.

Table 3.8-4. Activities participated in at Henry Hagg Lake.

Activity	Percent participating
Fishing	47%
Picnicking	20%
Boating	13%
Biking	7%
Swimming	4%
Other	4%
Hiking	3%
Wildlife viewing	2%
Total	100%

Source: Titre and Ballard 1999

Table 3.8-5. Visitors' favorite locations at Henry Hagg Lake.

Place	Percent Indicating as a Favorite Location
C-Ramp	20%
Sain Creek Picnic Area	14%
Elks Picnic Area	12%
Dam	10%
Scoggins Creek Picnic Area	8%
A-Ramp	7%
Fishing Pier (Handicap Accessible)	6%
Trails	7%
Tanner Creek	2%
Other	14%
Total	100%

Source: Titre and Ballard 1999

In addition to indicating the types of recreation activities they participated in, respondents were also asked if they had any favorite locations at Henry Hagg Lake. Almost two-thirds (66%) of users indicated that they had a favorite place. As shown in Table 3.8-5, the most frequently mentioned favorite place was C-ramp, followed by Sain Creek Picnic Area, Elks Picnic Area, the dam, and various other locations. “Good fishing” was the reason most often indicated when respondents were asked why a certain area was a favorite place. This large number of favorite places indicates that the park provides numerous facilities with a wide variety of recreation experiences and opportunities.

Respondents were asked to list changes and improvements they would like to see at Henry Hagg Lake. Desired changes included adding camping, improvement of fishing (especially higher limits), and increasing boating restrictions. Many of the respondents indicated a desire for no changes. Overall, most of the desired changes were related to management issues rather than facility-related (see Table 3.8-6). This suggests that most visitors are satisfied with the number and quality of existing facilities.

Table 3.8-6. Desired changes at Henry Hagg Lake.

Changes	Percent
Add camping	15%
Improve fishing/higher limits	15%
More boating restrictions	15%
None	14%
Better zoning, designations, reservations	10%
Clean up/general maintenance	6%
More fishing piers/docks	6%
Better patrol/enforcement	5%
Lower fees	5%
Other	9%
Total	100%

Source: Titre and Ballard 1999

Table 3.8-7. Desired new facilities at Henry Hagg Lake.

Desired New Facilities	Percent
Camping	27%
None	14%
Restrooms/drinking fountains	10%
Fishing docks	8%
Swimming areas	6%
Parking areas/roads	5%
Picnic areas	5%
Trails	5%
Nature interpretation	5%
Other	15%
Total	100%

Source: Titre and Ballard 1999

As shown in Table 3.8-7, when asked what specific facilities should be added, camping was mentioned most by respondents, followed by none, restrooms and drinking fountains, fishing docks, and a variety of other facilities. The fact that a significant number of respondents indicated that they desired no new facilities suggests that many visitors are satisfied with the number and variety of existing facilities. However, nearly one-third of respondents mentioned a desire for camping facilities, indicating a strong desire for overnight use which is not currently provided at Henry Hagg Lake.

Overall, according to the 1999 survey, visitors perceive few problems with capacity and conflict in the area. Only 3% of respondents indicated a conflict or problem during their experience at the park. Those that did experience a conflict reported boating-related conflicts (45%) and discourteous people (40%) as problems. Although use has generally been increasing, it appears the vast majority of park users are not experiencing conflicts with other users. Overall, visitors who participated in the survey were satisfied with their visit to Henry Hagg Lake. These survey results suggest that park management is successfully contributing to the positive experience of visitors.

3.8.1.3 Security and Safety

Security and safety patrols are conducted by the Washington County Sheriff's Office, Oregon State Police, and park rangers. The Oregon State Marine Board provides funding for the Sheriff's Office to provide marine patrol services. Daily marine patrol is provided from Memorial Day through Labor Day and on weekends through September. No marine patrol is provided during other periods of the recreation season. Marine patrol facilities and equipment include one patrol boat and a boathouse adjacent to the Recreation Area A West boat ramp. The Sheriff's Marine Patrol is augmented by U.S. Coast Guard Auxiliary Flotilla 712, and a volunteer retired State Police program. The Coast Guard Auxiliary Flotilla maintains a booth at the park from which they perform safety checks and generally assist the public. Their primary role is to provide education and distribute printed materials to facilitate boater safety. In addition, a bicycle patrol officer is provided by the Sheriff's Office on weekends from Memorial Day through Labor Day, and a Mounted Posse (usually three officers on horseback) is provided by volunteer officers on holiday weekends. Oregon State Police do occasional patrols through the park, largely to cite visitors for fish and wildlife violations, and also respond to call-in reports on an as-needed basis. Additional information regarding law enforcement is provided in Section 3.12, Public Utilities and Services.

There are two full-time park rangers at Henry Hagg Lake/Scoggins Valley Park. Park rangers are authorized to cite visitors for any violation of the general rules and regulations set forth in the Washington County Code Park Ordinance (Chapter 11.08). Public use regulations are posted on 17 bulletin boards throughout the park. Common violations for which visitors receive a citation include failure to purchase/display a park pass, unauthorized parking, off-road vehicle (ORV) use (prohibited in all areas of the park), open fires, and unauthorized fishing or camping (pers. comm., R. Blake, 2002). Citations result in a penalty fee of \$48 for failure to display a park pass and \$129 for all other violations. Approximately 10 years ago, however, the park instituted a program through which visitors receiving a violation for failure to purchase/display a park pass have the option to pay for the pass before leaving the park, with a \$5 late charge. If visitors pay for the pass before leaving the park, the \$48 penalty fee is waived and the pass fee and late charge funds are maintained in the park budget rather than going to the County court system (pers. comm., Blake, 2002). This program has successfully reduced the number of violations for failure to purchase/display a park pass and has enabled the park to recover park fees that would otherwise be lost to the County.

3.8.1.4 Special Events

Throughout the year, there are several special sporting events held at Henry Hagg Lake. These include bicycle, swimming, and running races; triathlons; water-skiing events; and unique events like "hi-tech adventure racing." In addition, Reclamation and the Bass Anglers Sportman's Society, along with several other agencies, sponsors an annual event called Catch a Special Thrill. This event involves taking approximately 30 disabled youths out in boats to go fishing. Applicants of special events may request exclusive use of the park or only of a portion of the park. No more than two applications for exclusive use of the park are approved each year. Special events require a Special Event Application that has to be reviewed and approved by the Park Supervisor. The cost of the permit varies depending upon the number of people participating in the event and the number of required facilities. In addition, there is a \$100 processing fee for all Special Use Applications. Those events requiring additional, or special handling for traffic, crowd control, or other law enforcement services must also be approved by the Washington County Sheriff's Department. If the roads within the park are used for the event, such as for

a bicycle race, then the permit also requires the approval of the Washington County Land Use and Transportation Department. For larger events, such as a triathlon, Sheriff's Reserve Officers provide event support and traffic control. Park rangers monitor each event and complete an evaluation form that is submitted to the Park Supervisor for review. For certain events, specific areas of the park may be closed to the public for the duration of the special event. If this is the case, the event organizers and park rangers provide advance notification of the closures to the public, and signage is erected at the park entrance and the affected areas.

Specific areas of Henry Hagg Lake are also available for group use for events such as reunions and large picnics. These events require an approved Group Use Application, reservation fee, and security deposit. The amount of the reservation fee and security deposit depend on the size of the group. Four areas are available for reservation: Recreation Area A West and Sain Creek for small groups, and Recreation Area C Ramp Pavilion and Sain Creek Pavilion for large groups.

3.8.2 Environmental Consequences

The three alternatives would physically affect recreation resources where new development is planned and may affect the overall recreation experience for visitors to Henry Hagg Lake. In general, the primary concerns in regard to recreation are growing recreation demand and recreation facility capacity. Recreation opportunities and user groups may be differentially affected by the three alternatives depending upon the extent and nature of recreation development, resource enhancement, and facility management.

Recreation resources potentially affected by implementation of the three alternatives include various recreation user groups (e.g., campers and anglers); physical space available for recreation facility development; and various recreation experience variables such as scenic values and crowding. Implementation of BMPs, such as pollution prevention measures, and mitigation measures, such as measures to reduce traffic congestion, would be included in each alternative (see Chapter 5.0 – Environmental Commitments). These measures would ensure that any adverse impacts associated with an increase in recreation capacity would be minimal. Overall, few adverse impacts to recreation resources would be anticipated from any of the alternatives. This section summarizes both adverse and beneficial effects of each alternative on recreation resources.

3.8.2.1 Alternative A - No Action - Continuation of Existing Management Practices

The No Action Alternative would result in the continuation of existing management practices, with recreation facility development guided by the preferred alternative in the 1994 EA. A number of new recreation facilities would be provided, as well as expanded and upgraded utilities and infrastructure. Recreation-related actions included under the No Action Alternative would have beneficial effects on recreation by increasing the capacity of existing facilities and introducing a new recreation opportunity (camping) at Recreation Area A East.

Additional facilities at Recreation Area A West would provide additional picnicking capacity and improve vehicle circulation in the existing parking area; however, no additional parking capacity would be provided. Developing trail connections to the shoreline trail would provide continuity along the trail and lesser conflicts between trail users and vehicles on the shoulder of the perimeter road.

Improvements at Scoggins Creek Picnic Area would alter the existing more primitive recreation experience at the site (e.g., gravel parking area and portable toilet) by providing more developed recreation facilities (e.g., paved parking lot and permanent vault restroom). Although the more primitive recreation experience would be reduced at this site, these improvements may benefit the park as a whole by shifting some recreation use and/or overflow from other sites to Scoggins Creek Picnic Area.

Additional facilities at Recreation Area C would greatly increase the parking capacity at the boat launch and reduce overflow parking on the perimeter road. Additional facilities at the Recreation Area C Extension would minimize crowding conditions at Recreation Area C, conflicts between non-motorized and motorized boaters, as well as other recreation areas, and increase overall day use capacity at the park.

Actions in other resource areas would have minimal effects on recreation resources. ODFW's continued management of fisheries in the reservoir would help maintain the reservoir's reputation as a premier fishing location. The restoration of scenic viewsheds through selective vegetation thinning may improve the scenic value of the overall recreation experience at the park. The development and implementation of a long-term management plan for rehabilitation and maintenance of the elk meadows would have a negative effect on recreation by reducing the physical space available for future recreation facility development.

Mitigation Measures and Residual Impacts (Alternative A)

Mitigation measures are not necessary because no adverse impacts are expected under the No Action Alternative. Residual impacts are discussed in the above narrative.

Cumulative Impacts (Alternative A)

Reasonably foreseeable cumulative impacts on recreation resources include changes in regional population growth and reservoir operations. There has been a large increase in population in the Portland metropolitan area that uses Henry Hagg Lake in the 8 years since the 1994 EA was prepared, with a corresponding increase in recreation use at the reservoir. Recreation demand is likely to continue to increase under all alternatives; however, all alternatives include provisions for controlling recreation use that would reduce but not eliminate cumulative effects from increased recreation use at Henry Hagg Lake. If the dam is raised, portions of all of the recreation areas, including the Master Trail, would be inundated. A mitigation plan for inundated facilities would be developed.

3.8.2.2 Alternative B - Minimal Recreation Development with Resource Enhancement

Alternative B includes only minimal recreation development relative to the other two alternatives; however, some additional facilities and enhancements are proposed. The most significant differences between Alternative B and the other two alternatives is that no development and/or enhancements are proposed at Recreation Area C Extension, Sain Creek Picnic Area, and Elks Picnic Area; and no camping is proposed at Recreation Area A East, although re-opening the area for day use is proposed.

Re-opening Recreation Area A East as a day use area may benefit the park as a whole by accommodating some recreation use and/or overflow parking currently occurring at other sites. This may improve the overall recreation experience by reducing conflicts or crowding in the park. Additional

facilities at Recreation Area A West would largely benefit only boaters and anglers; however, a designated concession area would likely benefit all park users. Effects of improvements at Recreation Area C would be similar to those under the No Action Alternative, although new facilities would emphasize boating and fishing user groups as opposed to other day users.

Actions in other resource areas under Alternative B may have some adverse effects on recreation, given its emphasis on resource enhancement. Overall wildlife and vegetation management, such as maintaining buffer zones adjacent to recreation sites and the reservoir, may decrease the physical area available for recreation, specifically for trail use. On the other hand, actions in several other resource areas may have beneficial effects on recreation for several user groups. The cooperation with ODFW and fishing clubs on habitat enhancement projects may increase the sustainability of the reservoir fishery. The restoration of scenic viewsheds through selective vegetation thinning may improve the overall recreation experience for visitors by improving scenic values in the park. The development of an interpretive program would provide educational and informational resources to park visitors and may attract new users who would be interested specifically in interpretive elements. The conditionally permitted recreation use within the Reclamation Zone would increase the area within the park available to anglers. Addition of disc golf at the Sain Creek elk meadow would provide an additional recreation opportunity during the peak season.

Recreation-related actions included under Alternative B would have beneficial effects on recreation; however, the effects would be somewhat less than those expected under the No Action Alternative given that no camping is proposed at Recreation Area A East and no development is proposed at Recreation Area C Extension. Several recreation enhancements are proposed under Alternative B, such as fish cleaning stations and boat dump facilities, which would have beneficial effects on recreation. Overall, Alternative B is not expected to have any adverse impacts on recreation; however, any beneficial effects to accommodate increasing recreation use would be fewer than those expected under the other two alternatives.

Mitigation Measures and Residual Impacts (Alternative B)

Mitigation measures are not necessary because no substantial impacts are expected under Alternative B. Residual impacts are discussed above.

Cumulative Impacts (Alternative B)

Cumulative impacts would be similar to those described under the No Action Alternative.

3.8.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

Under Alternative C, a number of new recreation facilities would be provided, as well as expanded and upgraded utilities and infrastructure. The most significant action under this alternative is the introduction of camping at Recreation Area A East. The campground development under Alternative C differs from that under the No Action Alternative in several ways, most notably in that it is a two-phased program with phase one serving as a pilot program to test the overall success of opening the area to camping. In addition, the camping season would be limited to between April 1 and Labor Day, a month shorter than the camping season under the No Action Alternative. If the phase two components are not developed, Alternative C would differ from the No Action Alternative by having 20 fewer campsites and no RV campsites, group camp, RV dump site, boat dock, or play structure. While both alternatives would

provide camping opportunities, the campsite development under Alternative C would be much less extensive if the phase two components were not developed. Less extensive campsite development would provide fewer recreation opportunities for several park user groups.

Access and trail improvements would be more substantial under Alternative C. Widening of the perimeter road shoulder would minimize conflicts between bicycle/pedestrian traffic and vehicles. In addition, a wider shoulder would better accommodate large volumes of athletes and/or recreationists that use the perimeter road during special events. A new, separate equestrian trail would provide an equestrian facility while minimizing conflict between user groups on the shoreline trail and/or perimeter road. There has been interest by local equestrian groups to establish a trail at Henry Hagg Lake, including one member of the AHWG. There is concern about potential conflicts with other user groups on the existing trail, particularly in forested areas where the trail is narrow. Mountain bikers in particular favor narrow, single-track trails, and widening the existing trail would change its character. If a trail were established for equestrian use, it would need to be outside the perimeter park road (upslope) and dedicated to horse use only. Because of limited Reclamation funding, any such trail would have to be established and maintained by equestrian groups. Because there are other equestrian riding opportunities nearby, such a trail on the limited land base at Henry Hagg Reservoir is a secondary priority. The addition of disc golf at the Sain Creek elk meadow would provide an additional recreation opportunity.

Effects of other resource actions would be the same as those discussed under Alternatives B and C. In addition, the placement of a floating restroom near the buoy line would have beneficial effects on recreation by minimizing boat ramp traffic caused by boaters returning to shore to use the restroom. Some effects on recreation may occur as a result of the potential implementation of a limited access plan at the entry road since visitors to the park would be unable to access the park without passing through the fee station. This would enable park managers to more accurately determine the number of park users.

Alternative C is the only alternative that includes the development of the Nelson Cove – Tualatin Watershed Education & Research Center. Development of this area would likely have a negative effect on the overall recreation experience of visitors due to the introduction of significant structures in an otherwise park-like setting. Given the proximity of Henry Hagg Lake to a major metropolitan area, such structures may not appear as incongruous as they would in a more rural or wildland setting; however, implementation of BMPs (see Section 5.1.1, Landscape Preservation and Impact Avoidance) would minimize adverse effects to the recreation experience of visitors. In addition, the development of this area as an education & research center would reduce the physical space available for future recreation facility development.

Recreation-related actions included under Alternative C would have beneficial effects on recreation by increasing the capacity of existing facilities and introducing new recreation facilities and opportunities. While there is some concern that reservoir surface capacity may be at or exceeding acceptable levels from a safety standpoint, actions under Alternative C would not likely cause any significant increase in boating on the reservoir. Overall, Alternative C is not expected to have any adverse impacts on recreation.

Mitigation Measures and Residual Impacts (Alternative C)

Mitigation measures are not necessary because no substantial impacts are expected under Alternative C. Residual impacts are discussed above.

Cumulative Impacts (Alternative C)

Cumulative impacts are the same as under the No Action Alternative.

3.9 Visual Resources

3.9.1 Affected Environment

Scoggins Valley Park and Henry Hagg Lake are located in the foothills on the east side of the western Oregon's northern coastal mountain range. This landscape is characterized by rolling hills of secondary coniferous forest interspersed with patches of meadow associated with rural residential and agriculture activities (Figures 3.9-1 – 3.9-3).

The most prominent visual features at Scoggins Valley Park are Henry Hagg Lake and the surrounding forested hills. The visual environment at the reservoir is composed primarily of natural-appearing rural landscapes of both closed and open canopy forest, meadow, and riparian woodland. Human presence is evident within the landscape but generally does not detract from the high level of scenic resources available at the park. Roads, recreation facilities, limited residential development, and rural industry associated with forestry, such as clearcuts and a mill, characterize human presence at and near the park (Reclamation 1994).

The highest quality views of the reservoir exist from spring to early summer when the reservoir level is at its highest and the meadows are green with newly emerging growth. These views can be compromised during low reservoir level conditions that expose large mudflat areas. The reservoir can be seen from several areas within the park, including the day use areas and a number of pullouts along the perimeter road. With the exception of the Sain Creek area, none of the recreation areas can be seen from the perimeter road due to vegetative buffers and topographic differences between day use areas and the road. The entire perimeter road, including Scoggins Valley Road, north of the reservoir, and West Shore Drive, on the south side of the reservoir, is designated as a "scenic route" by the Washington County Comprehensive Plan Rural/Natural Resource Plan Element. Scenic routes are identified as those being "excellent" scenic roads or "good" scenic roads with views of the Tualatin Valley or the Cascade Mountains (Washington County 2001). Under the Washington County Comprehensive Plan Rural/Natural Resource Plan Element, the park and nearby lands have been designated as a significant natural resource. The lands are designated as Wildlife Habitat, which are sensitive habitats identified by the ODFW and forested areas coincidental with water areas and wetlands (Washington County 2001).

Some day use areas, such as the Elks Picnic Area, Sain Creek Picnic Area, and Recreation Area C, can be seen from the reservoir or across the reservoir. Other recreation areas, such as Recreation Area A West, Recreation Area A East, and the Scoggins Creek Picnic Area, cannot be seen from the reservoir or across the reservoir due to shoreline vegetation that is more dense. Several private residences are visible from the reservoir; similarly, these private residences also have views of the reservoir (Reclamation 1994).

3.9.2 Environmental Consequences

Impacts on visual resources at the reservoir would occur under each of the three alternatives due to increased recreation development and use levels. The reservoir's proximity to the expanding Portland metropolitan area makes it a recreation destination for increasing numbers of people. However, BMPs and actions associated with each of the three alternatives would protect the existing visual resources.



Figure 3.9-1. Nelson Cove from adjacent elk meadow (low pool level).



Figure 3.9-2 Henry Hagg Lake from Recreation Area A West (low pool level).



Figure 3.9-3. Sain Creek Area at Henry Hagg Lake (low pool level).



Figure 3.9-4. Nelson Cove elk meadow and Henry Hagg Lake (low pool level).

Back of Figures 3.9-1 – 3.9-4

Nine BMPs have been specifically developed for landscape preservation, while others that address topics such as restoration would also benefit visual resources. In addition, Reclamation-issued land use licenses, leases, and permits would contain sufficient language and stipulations to protect existing resources and mitigate possible conflicts among the various users and between visitors and adjacent land owners. All new buildings and facilities would be designed and constructed to coincide with the existing visual character of the landscape and park setting.

In all three alternatives, impacts on the visual resources of lands surrounding the park are out of the control of the prescriptions of the RMP as they are privately owned. However, this does not prohibit Reclamation, WACO, interested non-government organizations (NGOs), and other applicable public agencies or private parties to coordinate with surrounding private landowners regarding the aesthetics of adjacent land management.

3.9.2.1 Alternative A - No Action - Continuation of Existing Management Practices

The semi-rural nature of the park and surrounding lands at Henry Hagg Lake could be impacted by the increase in recreation users and the facilities proposed in Alternative A. Expansion of existing recreation facilities are proposed for all existing recreation areas, particularly Recreation Area A East (including 70 campsites), Recreation Area A West, and Recreation Area C. However, improvement and expansion of facilities are occurring at sites that already exist, with the exception of the Recreation Area C Extension (the Cove Area). Expansion of these existing sites could reduce existing vegetation buffers and make the sites more visible from both the road and the reservoir; however, new native vegetation buffers are proposed as part of this alternative and would be a beneficial impact at recreation sites. New sites, which would more drastically alter the existing visual resource than expansion of existing sites, are not being proposed in this alternative. Elk meadows would be retained as open space with wildlife viewing potential, and the rural pastoral feel of these areas would be preserved. The addition of disc golf at the Sain Creek elk meadow would include small (less than 5 foot high) disc poles and metal nets. While these would affect the visual quality of the meadow from its interior, this minor effect would not extend to those looking into the meadow from the reservoir because of the small size of these structures. A beneficial impact would also result from the control of noxious weeds at the park. Erosion control measures proposed in this alternative also would have a beneficial impact on visual resources.

Mitigation Measures and Residual Impacts (Alternative A)

No mitigation measures are proposed because the implementation of Alternative A would not be expected to cause substantial impacts to visual resources. Residual impacts are discussed in the preceding narrative.

Cumulative Impacts (Alternative A)

Continued growth of recreation use at Henry Hagg Lake would have effects on visual resources through the number of users on the reservoir and adjacent land and corresponding effects to natural resources.

Visual resources would be significantly altered if the reservoir level were raised. Views of and from the reservoir would be significantly different. A significant percentage of the land and several of the recreation sites would be inundated, requiring mitigation in other areas of the park. Location and placement of recreation facilities along the new full pool would likely affect visual resources of the park.

Pool level fluctuations would continue to negatively affect views by exposing large areas of mudflats. Future fluctuations with a dam raise in effect would likely have an even more substantial effect on visual resources by exposing previous recreation areas at low pool drawdown period.

3.9.2.2 Alternative B - Minimal Recreation Development with Resource Enhancement

The semi-rural nature of the park and surrounding lands at Henry Hagg Lake could be impacted by the increase in recreation users and the facilities proposed in Alternative B, but to a lesser extent than under Alternative A. Minimal facilities are proposed for all existing sites, and no development is proposed in the Cove Area at the Recreation Area C Extension. Improvement and expansion of facilities are proposed at sites that already exist and experience high levels of use during the peak season. Expansion of these existing sites may reduce existing vegetation buffers and make the sites more visible from both the road and the reservoir, resulting in a minor negative impact to visual resources. Camping is not proposed under Alternative B, resulting in fewer impacts to visual resources than proposed under Alternative A.

Mitigation Measures and Residual Impacts (Alternative B)

No mitigation measures are proposed because the implementation of Alternative B would not be expected to cause substantial impacts to visual resources. Residual impacts are discussed in the preceding narrative.

Cumulative Impacts (Alternative B)

Cumulative impacts under Alternative B would be similar to those discussed under Alternative A.

3.9.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

The semi-rural nature of the park and surrounding lands at Henry Hagg Lake could be impacted by the increase in recreation users and the facilities proposed in Alternative C, which proposes the most significant level of recreation facility expansion. Expansion or improvement would take place at Recreation Area A East (including 100 campsites after both phases of development), Recreation Area A West (including day use facilities and expanded parking), Recreation Area C (including day use facilities and expanded parking), Scoggins Creek Picnic Area, the Recreation Area C Expansion, Sain Creek Picnic Area, and Elks Picnic Area. The presence of large RVs (50 RV sites proposed) at Recreation Area A East would impact the rural look of the park; however, the site is on a bluff above the reservoir, well vegetated, and thus not currently visible from the reservoir. The addition of a 40-slip boat dock at Recreation Area A East would change the reservoir's appearance by increasing the evidence of human presence on the reservoir. An impact to visual resources would also result from the doubling of the parking area at the Recreation Area C Expansion site, which would likely require the removal of existing vegetation. The addition of a parking and staging area for the proposed equestrian trail would also impact visual resources due to the resulting removal of vegetation; however, as this would be located on the upward side of the perimeter road, these impacts would be minor. An impact would result from the addition of structures such as a fee station and controlled access barriers by creating a more urbanized look to the existing rural County Road. In addition, the education & research center proposed for the elk meadows adjacent to Nelson Cove would impact scenic resources, particularly from on or across the reservoir. The development would be located on the bluff of a peninsula that is currently open meadow and could, depending on the size and orientation of the structure, be seen from a significant percentage

of the reservoir. While a sustainable design approach would minimize the profile of these new structures, they would alter the scenic quality of the shoreline as viewed from the reservoir or from the opposite shoreline. Impacts from the addition of disc golf at the Sain Creek elk meadow would be the same as described under Alternative B.

Mitigation Measures and Residual Impacts (Alternative C)

No mitigation measures are proposed because the implementation of Alternative C would not be expected to cause impacts to visual resources. Residual impacts are discussed above.

Cumulative Impacts (Alternative C)

Cumulative impacts under Alternative C would be similar to those discussed under Alternative A. Additionally, it is likely that the Portland metropolitan area will continue to expand and the population will continue to grow. It is also likely that recreation demand at the park will also continue to increase. Of the three alternatives, this alternative proposes the highest level of recreation resources to meet that demand. Regardless of the visual quality surrounding the park, human presence will be most evident in the landscape of the park as more facilities are developed to meet growing demand.

3.10 Land Use & Management

3.10.1 Affected Environment

3.10.1.1 Project Facilities and General Operations

Reclamation administers the lands within the boundaries of Scoggins Valley Park, owned by the United States. This includes all lands, facilities, and improvements. The park and water recreation resources are maintained and operated by WACO for public use and fish and wildlife enhancement under a management agreement with Reclamation. Reclamation has final authority on all matters pertaining to contract agreements between WACO and other agencies.

Scoggins Dam is maintained and operated by TVID, under contract with Reclamation, who is responsible for dam and reservoir operations and water supply releases to contract users. The operational goal of TVID is to fill the reservoir in the spring and draw it down in the fall, specifically to bring the reservoir volume up to 53,640 af by May 1st and draw back down to 33,040 af by November 1st. Table 3.10-1 lists additional data about the dam and reservoir.

Table 3.10-1. Scoggins Dam general and operational data.

Maximum full pool area	1,132 acres
Maximum full pool volume	53,640 af
Minimum pool area	411 acres
Minimum pool volume	33,040 af
Fill material used in construction the dam	3.7 million cubic yards
Length of dam crest	2,700 feet
Maximum bottom width of dam	1,100 feet
Outlet tunnel capacity	220 cfs
Spillway capacity	13,920 cfs

Source: U.S. Department of Interior 1994; www.tvid.org/water/ 2002.

3.10.1.2 Land Status and Management

Henry Hagg Lake was created in 1975 when Reclamation built Scoggins Dam as part of the Tualatin Project. The project was created to supply irrigation water to the Tualatin Valley, municipal water to local communities, and provide for flood control. Recreation development and fish and wildlife enhancements are also authorized project purposes. The TVID was formed by Oregon Statute in 1962 (prior to the development of the Tualatin Project) for the purpose of shepherding the project through the U.S. Congress (Reclamation 1994). During construction of the dam, TVID signed a 50-year operation and maintenance agreement with Reclamation to manage Scoggins Dam and to supervise water supply releases (pers. comm., J. Rutledge, 2002). TVID operates and maintains the dam under the general supervision of the Manager of Reclamation's Lower Columbia Area Office. TVID pays for a percentage of the operations and maintenance (O&M) of the dam. Reclamation pays for 40% of the O&M of the dam; all other contracting entities, including TVID, split the remaining 60%. In 2001, the responsible contracting entities were TVID (21%), Clean Water Services (14%), Hillsboro (9%), Forest Grove (8%), Beaverton (7%), and Lake Oswego (1%). For capital improvement projects related to issues such as dam safety, Reclamation assumes financial responsibility (pers. comm., L. Busch, 2002).

WACO entered into a separate lease agreement with Reclamation in March 1973 to administer Scoggins Valley Park and Henry Hagg Lake for public recreation use and fish and wildlife enhancement. The lease agreement for the park between Reclamation and WACO is for 50 years. The ownership of lands and developed facilities at the park remain the property of Reclamation during the lease agreement (Reclamation 1994).

Reclamation funded development of the park, which was planned by NPS. Two of three planned phases for the park's recreation facilities (representing approximately 55% of the original development plan) were completed in 1976. The third phase of the NPS plan was not developed because the level of park attendance in the early 1980s did not warrant its completion (Reclamation 1974).

Due to an increase in popularity and recreational use during the 1980s WACO developed a Master Plan (1989) that identified additional recreational facilities to meet growing demand. Because the area is owned by Reclamation, this represented a Federal action, thereby requiring that an Environmental Assessment be prepared to comply with NEPA to evaluate the Master Plan and to develop a proposed action based on the Master Plan (1994). In 1997, recreation development that resulted from the Master Plan included upgrades to the Sain Creek Picnic Area such as power and water, paved parking, paths through the area, picnic tables, drinking fountains, and a covered pavilion (pers. comm., C. Wayland, 2002).

The Reclamation Zone is an area around the dam (Figure 1.5-1) where Reclamation may restrict public use for safety concerns and to preserve the integrity of the dam. Fishing is currently allowed in the Reclamation Zone, but signs are posted to warn people away from the dam water intake structures. No public use is allowed on the downstream face of the dam or near the outlet structure.

3.10.1.3 Contractual Agreements

As discussed previously, WACO entered into a 50-year lease agreement with Reclamation in 1973 to administer Scoggins Valley Park and Henry Hagg Lake for public recreation use and fish and wildlife enhancement. Additionally, TVID signed a 50-year operation and maintenance agreement with Reclamation in 1976 to manage Scoggins Dam and to supervise water supply releases (Reclamation 1994).

The park is currently managed by WACO through the Facilities Management Division. There are other portions of the park or park activities that fall under the management responsibility of other entities contracted by WACO. ODFW is responsible for fish management at the reservoir. WACO is responsible for wildlife habitat management at the reservoir. Agreements exist between WACO and the U.S. Coast Guard Auxiliary Flotilla 712 and other volunteer public service entities. In addition, WACO has contracts with two private concessionaires to provide goods and services to users of the park. There are no agricultural or timber leases on lands within the park. Also, there are no permits issued by Reclamation or WACO to private parties for items such as boat docks or mooring buoys (pers. comm., C. Wayland, 2002).

ODFW is responsible for management of fish, including trout and several warm water species, at Henry Hagg Lake. A Memorandum of Understanding (MOU) between Reclamation and ODFW (formerly the Fish Commission of Oregon) was established in 1973 with no termination date. This is a mitigation agreement for construction, operation, and maintenance of a fish hatchery, as well as trapping, holding,

rearing, and stocking of anadromous fish for mitigation purposes due to the construction of the Scoggins Dam (Reclamation 1973). ODFW has discontinued its steelhead hatchery stocking program, requiring development of an alternative mitigation plan. Reclamation published an EA/FONSI in May 2001 that identified habitat restoration as the preferred mitigation plan. Agreements will be developed as needed to implement this plan.

As a component of mitigation for development of the dam, ODFW required Reclamation to maintain elk meadows at the park. The lease agreement between Reclamation and WACO included wildlife enhancements that have encompassed mowing of the elk meadows. WACO had agreements with private contractors that allowed them to cut and bale hay from these pastures, including the Reclamation zone at the south end of the reservoir. WACO mows several of the pastures also as a way to reduce the threat of fire late in the summer when the grass would become tall and dry. A few of the pastures, such as the one below the dam next to Scoggins Creek, are currently managed by private contractors through agreements with the TVID. The private contractor, a local farmer, disked and seeded the pasture below the dam in early 2002 and cut and baled hay from it in the summer of 2002 (pers. comm., C. Wayland, 2002).

The WACO Sheriff maintains a contract with the Oregon State Marine Board. From Memorial Day to Labor Day, the Sheriff provides marine patrol services and is the primary provider of law enforcement on the reservoir. The State Marine Board annually funds the sheriff's marine patrol and provides a building at Recreation Area A West boat ramp from which the patrol operates. Potential activities include boat inspections, emergency response, righting capsized vessels, towing disabled vessels, and removing hazards in the water (pers. comm., C. Wayland, 2002).

While there is no contractual agreement between WACO and the U.S. Coast Guard Auxillary Flotilla 712, there is a verbal agreement between them. The Coast Guard Auxillary facilitates boater safety on the reservoir by providing education and assisting the public in their boating safety needs. The services they provide are addressed in more detail in Section 3.12, Public Utilities and Services. WACO also has verbal agreements with a volunteer retired State Police group and a Sheriff's mounted posse to provide additional enforcement during busy summer weekends. These are also discussed in more detail in Section 3.12.1.6, Law Enforcement (pers. comm., C. Wayland, 2002).

There are two private concessionaires at the park who have contracts with WACO to provide goods and services. Each year when the park opens, they set up temporary facilities. The first, Rogal's Rentals, provides boat rentals and is located at the head of the Recreation Area C Boat Ramp. The second, Lunch Express, provides food service from a mobile truck also located at the Recreation Area C Boat Ramp (pers. comm., C. Wayland, 2002).

In June 2001, WACO entered into a license agreement (effective until December 31, 2011) with Reclamation that allows them to dispose of rock and soil generated from road maintenance activities throughout Washington County. A 13-acre parcel of land located between the dam and Scoggins Valley Road north of the Stimson Mill (NW ¼ of Section 21, T 1S, R4W) has been designated as the site where which soil and rock disposal and storage may occur (Washington County 2001).

3.10.1.4 Easements

There are 44 access easements (also referred to as warrantee deeds with "exceptions") that have been granted by Reclamation to private landowners whose properties are adjacent to Reclamation-owned land

and accessible only from the perimeter County Roads within the park. Reclamation has recently issued a phone line easement on Reclamation lands. Additionally, Reclamation currently has one road easement with Stimson Lumber in which an existing road was relocated onto Reclamation lands. Reclamation has recently issued a phone line easement on Reclamation lands. No flowage easements exist with regard to the shoreline of the reservoir, and there are no easements of any kind adjacent to the shoreline.

3.10.1.5 Encroachments on Reclamation Lands

There are no known encroachments on park lands by surrounding landowners or related items such as decks, sheds, storage, fences, trailers, or landscaping which might be located across property lines (pers. comm., C. Wayland, 2002).

3.10.1.6 Adjacent Land Use Patterns

Land ownership directly adjacent to the park consists primarily of private interests. Approximately half of the private ownership adjacent to the park boundary consists of about 70 private residences and small farms, ranging in size from less than 1 acre to several hundred acres. Access to these private properties from public roads is often via easements. The other half of private ownership adjacent to the park boundary consists of private timber holdings. Easements also provide access to nearby forest areas where logging and timber management activities occur (Reclamation 1994; pers. comm., C. Wayland, 2002).

Scoggins Valley Park is located within an area designated by the Washington County Comprehensive Plan as an Exclusive Forest and Conservation (EFC) District (www.co.washington.or.us/deptmts/lut/gis/intermap/map_land.htm 2002). The intent of the EFC District is to provide for “forest uses and the continued use of lands for renewable forest resource production, retention of water resources, recreation, and agriculture.” While the purpose of the EFC District is to encourage use of lands primarily for forest practices, the existence of parks within the district is also permitted (Washington County 1991). All of the land in the park boundary is within the EFC District; a significant amount of the land within several miles of the park boundary, particularly north, west, and south of the park, is in the EFC District as well. A significant portion of the land approximately 1 mile east of the park is designated as Exclusive Farm Use (EFU) (WACO 2002). According to the Washington County Comprehensive Plan, this zoning district intends “to preserve and maintain commercial agriculture land for farm use consistent with existent and future needs for agricultural products, forests, and open spaces” (Washington County 1991).

While the majority of lands adjacent to the park boundary are designated as EFC, there are lands nearby that are designated as EFU (previously discussed), Rural Industrial (R-IND), Agricultural and Forest-5 (AF-5), Agricultural and Forest-10 (AF-10), and Agricultural and Forest-20 (AF-20). Parcels with these designations are generally located in three small, separate clusters within the vicinity of the reservoir (www.co.washington.or.us/deptmts/lut/gis/intermap/map_land.htm 2002). The first cluster is southeast of the reservoir, immediately downstream of Scoggins Dam, where approximately 210 acres of land are zoned as R-IND. According to the Washington County Comprehensive Plan, this zoning district “provides for county industrial uses needed to support the natural resource base consistent with the rural character and rural level of services” (Washington County 1991). The Stimson Mill, which operates a timber product processing and manufacturing facility, owns this land. Across Scoggins Valley Road from the Stimson Mill are 22 parcels, ranging in size from ¼ acre to 5 acres, zoned as AF-5. According to the Washington County Comprehensive Plan this zoning district “provides for rural residential uses while retaining the area’s rural character and conserving its natural resources” and requires a 5-acre minimum

lot size for the creation of new parcels (Washington County 1991). There are several more parcels along Scoggins Valley Road that are zoned either AF-5, R-IND, and EFU. Farther east, most of the land is designated as EFU (www.co.washington.or.us/deptmts/lut/gis/intermap/map_land.htm 2002).

The second cluster of parcels near the park not designated as EFC is located approximately ½ mile north of the reservoir on Stepien Road and is comprised of several small parcels designated as AF-20. This zoning district provides for rural residential uses while retaining the area's rural character and conserving its natural resources, similar to AF-5, but requires a 20-acre minimum lot size for the creation of new parcels (Washington County 1991). The third cluster is located at Cherry Grove, a small community approximately 2 miles southwest of the reservoir. Parcels designated EFU, AF-5, AF-10, and AF-20 exist in Cherry Grove (www.co.washington.or.us/deptmts/lut/gis/intermap/map_land.htm 2002). The AF-10 zoning district also provides for rural residential uses similar to AF-5 and AF-20, but requires a 10-acre minimum lot size for the creation of new parcels (Washington County 1991).

In 1994, when the EA was completed for the 1989 Master Plan, the park was considered a non-conforming use within the EFC District. As a requirement for capital improvements made to the park in the mid-1990s, a land use application was submitted for review by the Washington County Department of Land Use and Transportation (DLUT) in order to bring the park into conformance with local land use regulations. This application was approved to allow for recreation improvements and to replace the park's non-conforming status with a Special Use Approval (Reclamation 1994; pers. comm., C. Wayland, 2002).

3.10.2 Environmental Consequences

In general, both beneficial and adverse impacts to land use could result from the proposals within all three alternatives. These impacts could include, for example, preservation of open space, concentration of recreation use, or alternatively, dispersed recreation use. However, the BMPs in Chapter 5, Environmental Commitments, state that Reclamation-issued land use licenses, leases, and permits would contain sufficient language and stipulations to protect existing resources and reduce potential conflicts among the various users and between visitors and adjacent land owners.

3.10.2.1 Alternative A - No Action - Continuation of Existing Management Practices

In general, Alternative A would increase the developed capacity for recreation use at Henry Hagg Lake and Scoggins Valley Park as a way to accommodate existing and projected use while protecting resources. This approach would have mostly positive land use benefits by concentrating recreational activity in developed and managed recreation sites and by adding new facilities to limit visitor use to more manageable levels. Specific impacts are discussed below.

As a component of mitigation for initial development of the dam, Reclamation agreed to maintain pastures at the park to compensate for the loss of deer and elk winter foraging areas. WACO, as manager of the park, was made responsible for management of the pastures at the park (approximately 140 acres). However, no contractual agreement was ever formalized between Reclamation and ODFW regarding the maintenance of these meadows. In addition, a management plan was never developed regarding specific parameters for maintenance of these areas. Alternative A proposes a long-term management plan for elk meadow rehabilitation and management, resulting in beneficial impacts on land use by preserving open space at the park.

Beneficial impacts to land use would result from continuation of existing management agreements as proposed in Alternative A. The addition of 70 campsites to Recreation Area A East would add an overnight recreation component that does not currently exist at the reservoir and which may impact land use patterns in that area of the park. An adverse impact to land use could result if demand for camping exceeds supply or if there were a lack enforcement staff. However, WACO would place limits on the number of campsites and users and would increase park staff to correspond with increased needs presented by camping and expanded facilities. Therefore, no negative impacts to land use would be anticipated.

Mitigation Measures and Residual Impacts (Alternative A)

No mitigation measures are proposed for Alternative A because the actions under this alternative do not have adverse impacts on land use and management in the RMP study area. Existing agreements will be maintained and coordination of services continued to ensure that the recreation and natural resources of the reservoir, park, and surrounding community are not compromised. Residual impacts are discussed in the above narrative.

Cumulative Impacts (Alternative A)

The population of the Portland metropolitan area has grown significantly in the last 10 years and is likely to continue to grow. The expanding population would likely increase development pressure on the privately owned land around the reservoir. However, Scoggins Valley Park is located within a large area designated by the Washington County Comprehensive Plan as an EFC District.

Land use in the park would be significantly altered if the reservoir level were to be raised. A significant percentage of the land and several of the recreation sites would be inundated requiring mitigation in the remaining areas of the park. The amount of land in the park that would be required for mitigation of the loss of recreation sites would result in a higher percentage of the land in the park being developed, unless additional land would be purchased.

3.10.2.2 Alternative B - Minimal Recreation Development with Resource Enhancement

Land use and management impacts under Alternative B are very similar to Alternative A. Management agreements are recommended to protect resources, particularly natural resources, in this alternative since the focus is on fish and wildlife resource enhancement with minimal recreation development. In general, the natural resource emphasis of this alternative may have a minor adverse land use impact by providing fewer recreation facilities for the increasing demand. The capacity of some individual sites, such as boat ramp parking, may be exceeded, resulting in dispersed use. However, adequate enforcement, which is also proposed in this alternative, would alleviate these potential impacts. Specific impacts are the same for Alternative B as they are for Alternative A, except for those discussed below.

Alternative B proposes the development of a long-term management plan of elk meadows; however, it also contains monitoring as a component of the plan to determine the success of management practices and need for the meadows in the future. Disc golf at the Sain Creek elk meadow would be seasonal and would not affect the primary use of the site, which is for wintering elk forage.

Under Alternative B, recreation use would be conditionally permitted in the Reclamation Zone near the dam, which could result in potential safety and security impacts; however, information regarding appropriate uses and closures of the area would be provided on publicly distributed materials. Reclamation may restrict some recreation uses in the Reclamation zone for public safety purposes if needed.

Mitigation Measures and Residual Impacts (Alternative B)

No mitigation measures are proposed for Alternative B because the actions under this alternative do not have adverse impacts on land use and management in the RMP study area. Residual impacts are discussed in the above narrative.

Cumulative Impacts (Alternative B)

Cumulative impacts under Alternative B would be similar to those discussed under Alternative A.

3.10.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

Land use and management impacts under Alternative C are very similar to Alternatives A and B. In general, Alternative C also proposes to increase the developed capacity for recreation use at the park to accommodate existing and projected demand while protecting resources. This approach would have mostly positive land use benefits by concentrating recreational activity in developed and managed recreation sites and by adding new facilities to limit visit use to more manageable levels.

A beneficial impact to land use would result from the phasing of development in Alternative C. Proposals in this alternative include phasing for the development of Recreation Area A East, where camping would occur, and the Recreation Area C Extension area, where day-use would be expanded. Phasing the development of these two areas would allow for a gradual increase in recreation use and an opportunity to monitor the impacts of increased use.

Both adverse and beneficial impacts would be anticipated from the development of the education & research center at the Nelson Cove elk meadow. An adverse impact would result from the decrease in open space and land used for natural resources enhancement at the park. A beneficial impact would result from the concentration of land uses at the park and accommodation of other user groups for education and research. A rural park, which has existing infrastructure, surrounded by a variety of natural resources (water, fish, vegetation, wildlife) and is in proximity to several potential user groups (school and universities) is an ideal location for this type of facility.

Impacts related to disc golf at the Sain Creek Picnic Area and conditional use of the Reclamation Zone are the same as those for Alternative B.

Mitigation Measures and Residual Impacts (Alternative C)

No mitigation measures are proposed for Alternative C because the actions under this alternative do not have adverse impacts on land use and management in the RMP study area. Residual impacts are discussed in the preceding narrative.

Cumulative Impacts (Alternative C)

Cumulative impacts under Alternative C would be similar to those discussed under Alternative A.

3.11 Socioeconomics

3.11.1 Affected Environment

Current population trends, employment, and income for Washington County are discussed below.

3.11.1.1 Demographic Profile

During the 1990s, Washington County's population grew 42.9%, from 311,554 in 1990 to 445,342 in 2000. The state of Oregon's total population growth rate over this same time period was an increase of 20.4%, while the U.S. total population growth rate was 13.1% (U.S. Census Bureau 2000a).

The city limits of Portland (population 529,121) are adjacent to Washington County to the east. However, the Portland metropolitan area extends west into Washington County. Beaverton (population 76,129), a suburb of Portland, is the largest city in Washington County. The next largest cities are Hillsboro (population 70,186), Tigard (41,223), Tualatin (22,791), and Forest Grove (17,708). The closest town to Henry Hagg Lake is Gaston (600).

Table 3.11-1 shows the age distribution in both Washington County and the State of Oregon in 2000. For the most part, the population distribution and categorical shifts in Washington County resemble that of the state and the country, although population is growing at a much quicker pace.

Table 3.11-1. Washington County and Oregon State population and age distribution.

County	2000 population	% change since 1990	% of people under 5 years of age	% of people under 18 years of age	% of people over 65 years of age
Washington	445,342	42.9	7.9	26.9	8.8
Clackamas	338,391	21.4	6.5	26.2	11.1
Multnomah	660,486	13.1	6.4	22.3	11.1
Yamhill	84,992	29.7	7.0	26.9	11.7
Clark (WA)	345,238	45.0	7.8	28.7	9.5
Oregon	3,400,000	20.4	6.5	24.7	12.8
United States	281,400,000	13.1	6.8	25.7	12.4

Source: U.S. Census 2000a.

3.11.1.2 Economic Setting

Before the 1970s, the agricultural and timber industries generally supported the local economies of the more rural sections of Washington County. The Scoggins Valley Mill is immediately downstream from the dam and is still in operation. The more urban east side of the county, where the Portland metropolitan area has expanded, has grown from a traditional timber resource-based economy (pulp, paper, and lumber manufacturing) to an economy based on high technology manufacturing and commerce. Economic growth in the area has increased in the 1990s, particularly due to the unprecedented population growth of Washington County because of opportunities in the high technology sector. More than 1,300 manufacturing companies are located in the Portland area. The five largest are Intel Corporation, Freightliner Corporation which builds heavy duty trucks, Nike Inc., Precisions Castparts Corporation which makes aerospace castings, and Consolidated Freightways Inc.

(www.oregonbioscience.com/career/destination_economy.htm). Residential and commercial construction has been strong as a result of the growing economy, as have retail trade and services jobs. Significant suburban growth near Forest Grove was particularly evident during the 1990s. Rural residential growth has also increased steadily during this time.

As of 1999, there were 207,419 employees in the county with an annual payroll of over \$7.7 billion. Currently forestry, logging, and agriculture provide only a very small fraction of those jobs. The industry that provides the most jobs in Washington County is manufacturing (37,147) with the majority of those being in computer, semiconductor, and other electronic product manufacturing. Retail trade (27,075), wholesale trade (17,670), and health care (14,935) are the other industry sectors that provide a large number of jobs in the county (U.S. Census 2000b).

In 2000, there were 169,162 households in Washington County with an average of 2.61 persons per household. There were 176,758 high school graduates (39.7% of residents in the county) and 59,753 college graduates (13.4% of residents in the county). The 1997 median household income of Washington County was \$49,753, well above the statewide median household income of \$37,284. The percentage of county residents (6.7%) below the poverty level was significantly lower than the percent of state residents (11.6%) (U.S. Census 2000a).

3.11.1.3 Park Funding

There are many actions identified in the alternatives that would require funding commitments from WACO. While Reclamation often provides cost share monies up to 50% for recreation development and 75% for fish and wildlife enhancements, all operation and maintenance costs are paid by WACO. Reclamation does not subsidize the management costs at Henry Hagg Lake, which includes costs associated with recreation, as well as management of the elk meadows. The County relies heavily on revenues generated from user fees to meet these costs. This RMP provides for additional facilities that will require maintenance, and it provides for developing, rehabilitating, planting, managing, and monitoring of the elk meadows that would result in higher costs. To provide these services, WACO must increase fees and/or identify additional sources of revenues (e.g., camping fees and available grant monies derived from providing camping) to offset the ever-increasing maintenance costs.

Scoggins Valley Park's primary revenue source is from park-generated funds such as user fees, reservation fees, citation fees, and concessionaire fees. The secondary revenue source is from tax-generated funds associated with recreation at the park such as the State's Recreational Vehicle tax, and the Marine Fuel tax. Park-generated funds are expected to amount to \$324,500 in 2002 and tax-generated funds are expected to amount to \$165,250 (\$161,250 from the Recreational Vehicle tax and \$4,250 from the Marine Fuel tax). Concessionaire fees amount to approximately \$3,000. A third revenue source, if needed, is the County general fund, which is maintained through property taxes. The park will be requesting \$7,258 from the County general fund to supplement the \$490,000 revenue budgeted in 2002 to meet expenses. In 2001, an atypical fiscal year due to drought conditions, the resulting low reservoir level, and the decrease in park usage, the park had to request \$70,304 from the County general fund to meet operating expenses. In contrast, from 1999-2000, the park was able to contribute over \$18,000 back into the County general fund because revenue exceeded expenditures for those years (pers. comm., C. Wayland, 2002).

One of the annual expenditure items is the loan payment made by WACO to Reclamation for a portion of the park's development fees. Reclamation funded development of the park, planned by the NPS, with the agreement that WACO would repay 50% of the approximate \$2.4 million initial development cost over the 50-year period of the lease. According to lease agreement No. 14-06-100-7961, Article 17 states that the agreement shall be effective of November 15, 1973 and remain in effect for a period of 50 years from the due date of WACO's first annual installment. The first installment by WACO to Reclamation was made March 1st, 1980 after final costs for the development of the park were determined. After 2002, there will be 28 more annual installments on the loan, the last being on March 1, 2030, at which point the agreement will terminate. Approximately \$505,337 has been paid by WACO to Reclamation thus far, and there is approximately \$597,186 left on the contract as of 2002. The annual payment for 2002 will be approximately \$43,360 (pers. comm., C. Wayland, 2002).

3.11.2 Environmental Consequences

Because the impacts of the three alternatives are similar in regard to potential socioeconomic impacts, the following narrative is presented to highlight their differences. In each of the three alternatives, proposals include recreation site expansion and development, wildlife and vegetation management, fisheries management, cultural resource protection, emergency services and enforcement, and RMP implementation. The implementation of these proposals would provide some minor additional employment opportunities in the local community from increasing park staff and concession possibilities, which would have minor positive impacts on the local economy. Additionally, improvements to the park's recreation and wildlife habitat resources would increase the amenity value of Henry Hagg Lake and Scoggins Valley Park, making the region more desirable; however, this increase in amenities would not likely result in any measurable changes to the local socioeconomic conditions.

The addition of camping as proposed in Alternatives A and C would provide a beneficial impact in the form of an additional revenue source for WACO. This revenue would provide the money necessary to implement recreation development (Reclamation and WACO cost-share of 50/50), natural resource enhancements (Reclamation and WACO cost share of 75/25, respectively), and maintenance of each (WACO responsible for 100% of costs). With the addition of camping, WACO would also be eligible to receive State grants and tax revenue (RV tax funds) that are not currently available to the park. If camping-generated funds are not available, as would be the case in Alternative B, WACO would have to continue to fund habitat enhancement and maintenance, such as that of the elk meadows, another way. An increase in park user fees, for example, would be an adverse socioeconomic impact to the local community.

A financial responsibility of WACO outside of managing the park is to provide Sheriff patrol on the reservoir, within and in proximity to the park. The Sheriff is currently partially funded by the Oregon State Marine Board to provide marine patrol services on the reservoir. However, no additional contracts exist or funds provided from the park to provide for public services.

Under each alternative, recreational use of park facilities would likely increase, thereby putting additional pressure on local enforcement and emergency service providers. Law enforcement under Alternative A proposes continued enforcement by the Sheriff and coordination with Oregon State Police and the Coast Guard Auxiliary. Alternatives B and C are the same, but with a qualifier that adequate enforcement is maintained commensurate with levels of public use. The law enforcement burden for the

Sheriff is likely to be greatest in Alternative C and the least for Alternative B in regard to recreation level development and expected use. However, revenue generated from camping in Alternatives A and C might offset the additional costs of WACO enforcement and security associated with camping in particular.

All three alternatives include improvements that should enhance recreation and tourism-related revenues for the local economy, although it is difficult to accurately project a correlation between the three alternatives and any substantial differences in local economics.

Mitigation Measures and Residual Impacts (All Alternatives)

No mitigation measures are proposed since none of the alternatives are expected to directly affect local population or income to a substantial degree. No significant residual impacts related to socioeconomics are anticipated for any of the alternatives.

Cumulative Impacts (All Alternatives)

Increased recreation use and demand in addition to regional population growth are likely to continue to put pressure on existing and proposed recreation facilities and natural resources at Henry Hagg Lake. Privately owned land adjacent to Reclamation property around the reservoir is also likely to be subject to increasing development pressure, as discussed in Section 3.10 (Land Use and Management).

Cumulative impacts to socioeconomics would result if the reservoir level were raised. A pool raise would inundate a significant percentage of the land in the park, including recreation sites, roads, and wildlife habitat and would affect some private residential property. Mitigation for this action would likely require substantial redevelopment of recreation sites, changes to the existing county perimeter road, and wildlife enhancement.

3.12 Public Utilities and Services

3.12.1 Affected Environment

Most Reclamation-owned and WACO-managed public facilities at Henry Hagg Lake consist of recreation facilities such as day use areas with restrooms (discussed in greater detail in Section 3.8, Recreation). Utility infrastructure varies around the reservoir, ranging from limited facilities such as Scoggins Creek Picnic Area to fully developed facilities that provide electricity, water, and wastewater disposal. Police, fire, and emergency services are provided to the area by the Washington County Sheriff's Department and the Gaston Rural Fire District, as discussed below.

3.12.1.1 Electrical

West Oregon Electric Co-op provides electrical service in the area. Electrical power is available to most recreation sites, supplying light and power for restroom facilities and maintenance needs. Specifically, service provided at the park administration station and maintenance yard, Recreation Area A East, Recreation Area A West, the Recreation Area C, Sain Creek Picnic Area, and Elks Picnic Area is 480-volt, 3-phase. Power is also supplied to the water service plant adjacent to the Sain Creek Picnic Area. Public outlets that are 110-volt, single-phase are available in the pavilions at Recreation Area C and Sain Creek. Site lighting is limited to surface-mounted fixtures at restrooms, and no roadway lighting is provided in the park. Distribution lines around the park are overhead pole-mounted. No natural gas is available within the park (pers. comm., C. Wayland, 2002).

3.12.1.2 Potable and Non-Potable Water

Four separate water systems supply water to various areas of the park, two potable and two non-potable. These systems currently supply an adequate amount of water to park facilities. Potable water is supplied to the north side of the park (Recreation Area A East and Recreation Area A West) by the Hillsboro Utility Water Commission (HUWC) system. The 12-inch diameter supply line to these areas is owned by HUWC and connects to a pumping station. The pumping facilities and 4-inch diameter transmission line from the pumping station are owned and maintained by WACO. The service line to the ranger station and maintenance yard from the 4-inch diameter transmission line is 1½-inch in diameter, and the service lines extending to the two recreation areas are ¾-inch diameter. All water supplied on this system is metered (pers. comm., C. Wayland, 2002).

Potable water is supplied to Recreation Area C and the Sain Creek Picnic Area by a system of wells. Water from the wells is pumped to Restroom 8 at the Sain Creek Picnic Area where it is pressurized and chlorinated before being distributed back to both areas. This system was installed during the 1997 upgrade to the Sain Creek Picnic Area (pers. comm., C. Wayland, 2002).

Non-potable water is supplied to Recreation Area C and the Sain Creek Picnic Area by Sain Creek surface flows that are filtered and stored in a 15,000-gallon tank located at an old water treatment plant and pumping station approximately ¼ mile south of the creek. They are pressurized at the pumping station and distributed to both areas (pers. comm., C. Wayland, 2002).

Fourth, non-potable water is supplied at the Elks Picnic Area by an in-house water supply system. A pump and 600-gallon storage tank are located at the restroom and supplies water to two flush toilets

only. These facilities are owned and operated by WACO. No water is currently provided to the Scoggins Creek Picnic Area (pers. comm., C. Wayland, 2002).

3.12.1.3 Wastewater

Wastewater is currently treated using conventional, on-site treatment and disposal units in all locations. All vault toilets in the park have been converted to flush toilets that utilize conventional septic disposal systems. There are currently six restrooms in operation and two boat waste dump stations in the park. There are three inactive restrooms located in Recreation Area A East, which is closed. WACO currently contracts with Aloha Sanitation to pump the solid waste from storage tanks associated with the septic systems. All tanks are pumped approximately once per year (pers. comm., C. Wayland, 2002).

Recreation Areas A East and A West share a common drain field disposal system. At Recreation Area A East, three restrooms drain to a septic tank system where solids are settled from the waste stream and primary treatment is provided. Each of the two septic tanks has an effective volume of 5,340 gallons. The effluent then drains to a concrete pumping vault where pumps convey it to a gravity drain field across the park road between Recreation Areas A West and A East. At Recreation Area A West, waste from two restrooms and one boat waste dump drain to a septic tank system similar to one used in Recreation Area A East. The effluent from this system is also pumped to the same gravity drain field that contains 14,000 lateral feet of 4-inch diameter perforated pipe. No evidence of distress or overloading of the drain fields has occurred, and none of the effluent has surfaced through the park road cutback downstream of the drain field (U.S. Department of Interior 1994; pers. comm., C. Wayland, 2002).

Recreation Area C has a system similar to that of Recreation Area A. There are two restrooms in Recreation Area C, each of which has a septic tank system with an effective volume of 5,340 gallons. One of these systems also receives waste from a boat waste dump station. The effluent then drains to a concrete pumping vault where pumps convey it to a gravity drain field containing 3,550 lateral feet of 4-inch diameter perforated pipe located between the recreation area and park road. The system was checked in 1997 during upgrades to nearby Sain Creek Picnic Area, and there were no signs of distress or overloading in the system (U.S. Department of Interior 1994; pers. comm., C. Wayland, 2002).

The Elks Picnic Area has a restroom with two flush toilets. Two 1,000-gallon holding tanks collect sewage and require pumping approximately two to three times a year at current usage rates. The Scoggins Creek Area has portable toilets that are supplied by a private contractor who maintains them and pumps them weekly (pers. comm., C. Wayland, 2002).

3.12.1.4 Solid Waste

Solid waste collection occurs at trashcans located in the day use areas of the park; park employees check them daily and empty them at least once a week, depending on use levels. An average of 15-20 cubic yards of solid waste is collected on a weekly basis during the summer season. WACO contracts with USA Waste of Oregon out of Forest Grove to collect solid waste (pers. comm., C. Wayland, 2002). It is taken to a transfer station in Forest Grove and then to the Hillsboro Landfill in Washington County, which has capacity for approximately 25 more years.

3.12.1.5 Fire Protection and Emergency Services

Both the Gaston Rural Fire District (GRFD) and the Oregon Department of Forestry (ODF) are responsible for fire protection at the park. In general, GRFD is responsible for the southern two-thirds of the park, while ODF is responsible for the northern third of the park. The district line crosses the reservoir and park near the Recreation Area C Boat Ramp. In the case of fire response, GRFD and ODF are both first alarm providers for the park area and respond to calls, assisting each other during the response. However, ODF does not respond to emergency calls for medical or rescue situations. GRFD and ODF operate under a mutual aid agreement with each other as well as other fire protection providers in the area to assist each other when additional services are required (pers. comm., G. Juber, 2002 and J. Smith, 2002).

Response time to the dam or the Recreation Area C Boat Ramp by the GRFD is less than 5 minutes, while areas on the opposite side of the reservoir generally take up to 20 minutes to reach. In 2001, GRFD responded to 42 calls at the park and in the surrounding area (Scoggins Valley), including 21 for first aid, 20 for fire, and one other. GRFD has received funds from WACO in the past to provide service to the park. Washington County currently has an intergovernmental agreement with the GRFD that provides for an annual payment of \$10,000 to provide compensation for emergency response services to Henry Hagg Lake. ODF response time is about 12-15 minutes, depending on the location of personnel and equipment at the time of the call. In the last 3 years (1999-2001), ODF has made seven runs responding to calls, four of which were in response to wildfires (pers. comm., G. Juber, 2002).

As of June 2002, GRFD personnel include one part-time chief, two full-time firefighters, and additional part-time assistance totaling 3 full-time positions. There are also 36 volunteer firefighters who work for the GRFD. GRFD equipment includes one rescue vehicle, three 1,000-gallon pumpers with the capacity to pump 250 gallons per minute, one 3,000-gallon water tender, two light brush-rigs, and two staff vehicles (pers. comm., J. Smith, 2002). ODF maintains a crew of 12 firefighters during the summer season, which typically begins around the end of June and ends with the coming of fall rains sometime in October. The Protection Unit Forester is one of two full-time positions supported year-round by ODF. ODF equipment for the Forest Grove Protection District includes three 500-gallon fire engine brush-rigs and three 200-gallon fire engine brush-rigs (pers. comm., G. Juber, 2002). The ODF office for the Forest Grove Protection District is in Forest Grove.

Both the GRFD and Metro-West Ambulance service respond to emergency calls in or near the park. When a 911 call is placed, the Washington County Consolidated Communication Agency (WACCCA) dispatch service determines which entities should respond to the call and contacts a dispatcher. GRFD responds to all fire and accident/emergency calls, while Metro-West typically only responds to emergency calls involving serious trauma, reports of chest pain, or drowning and water-related accidents. GRFD may request assistance from Metro-West at any time. Individuals requiring emergency medical facilities are transported to either Emanuel Hospital or Health Center and Oregon Health Sciences University Hospital. Lifeflight provides helicopter transport for critical cases to trauma centers at the same two hospitals (pers. comm., J. Smith, 2002). There are several near-drownings and approximately one drowning death each year, as was the case in 2001 (pers. comm., M. Alexander, 2002). In 2001, Metro-West made a total of six runs to the park and eight runs to roads near the park, such as Scoggins Valley Road. Response to the park was for chest pain, a bee sting, trauma, and possible near drowning. Response to roads surrounding the park was primarily for motor vehicle accidents. Response time for

Metro-West is 11 minutes to the park entrance and up to 30 minutes once in the park. Response times vary depending on the location of the nearest ambulance (pers. comm., J. Lee, 2002).

3.12.1.6 Law Enforcement

The Washington County Sheriff's Department provides law enforcement throughout the county, having jurisdiction in all of the county's unincorporated areas. There is currently no specific contract between the Sheriff and Reclamation, and there is no specific assignment to the park.

On November 12, 2001, Congress signed Reclamation's law enforcement bill (HR 2925) into law. This law requires that the Secretary of Interior issue regulations necessary to maintain law and order and protect persons and property within Reclamation projects and on Reclamation lands. It also authorizes the Secretary to enter into agreements with State, Tribal, and local law enforcement agencies to carry out law enforcement at Reclamation sites and facilities, and to reimburse those agencies for their services. As of now, it is unclear whether this will result in a formal contract between the Sheriff and Reclamation (U.S. Department of Interior 2001).

The Sheriff has not established specific response times to the park. One deputy is on patrol in that area of the district and typically responds in less than 45 minutes. Historically, response times have varied due to the officer's location at the time of the call. Typical park disturbances that require law enforcement are vandalism, theft, domestic disturbances, alcohol-related misconduct, and more recently, gang activity. In 2000, a gang-related shooting occurred elsewhere in Washington County and the body was left on Herr Road outside of the park boundary (pers. comm., M. Alexander, 2002). Prank 911 calls are frequently placed from pay phones in the park. These calls are responded to on a routine basis in case there is an actual emergency. Disturbances are often reported by surrounding property owners and are typically related to littering, vandalism, parties, and unauthorized fireworks. Park rangers are always present during operating hours, have the authority to cite visitors for park rule violations, and communicate with the Sheriff as needed (pers. comm., A. Julian, 2002). A camp host would be on site during operation of the Area A East campsite, which would aid in enforcement of park rules.

The Washington County Sheriff, the primary provider of law enforcement on the reservoir, has an annual contract with the State Marine Board to provide marine patrol services from Memorial Day to Labor Day. In 2002, the reservoir began opening earlier than in previous years (March 1) for fishing season and began closing later (November) than in past years. The Sheriff requested additional funds from the State Marine Board to patrol the reservoir during this time. Due to this request being denied, the WACO Sheriff did not provide marine patrols prior to Memorial Day or after Labor Day in 2002. The Sheriff's marine patrol has a building at the Recreation Area A Boat Ramp from which the patrol operates. Their equipment includes an 18-foot boat, a flat bottom boat, and a zodiac (inflatable) boat. Potential activities include boat inspections (both on the water and at the boat ramp), emergency response, righting capsized vessels, towing disabled vessels, removing hazards in the water, and checking for fishing licenses (pers. comm., A. Julian, 2002).

Boater conflicts on the reservoir are fairly limited due to the high visibility of enforcement at the park and on the reservoir and because the reservoir has been divided into two sections. A buoy line is located from approximately the Recreation Area A West Boat Ramp across the reservoir to a point immediately south of the Sain Creek inlet. The southeast side of the lake has a 35 mph speed limit allowing for pleasure boating, water-skiing and PWC use. The northwest side of the reservoir is designated as a no-

wake zone and allows for slow boating, windsurfing, sailing, canoeing, and kayaking. Boater conflicts that do arise are typically in regard to congestion on the reservoir and at the boat ramps during hot summer, heavy use days (pers. comm., C. Wayland, 2002).

The Sheriff's Marine Patrol is augmented by U.S. Coast Guard Auxiliary Flotilla 712, a volunteer retired State Police program, and the Sheriff's Mounted Posse. The Coast Guard Auxiliary Flotilla maintains a booth at the park from which they perform safety checks and generally assist the public. They do not, however, provide any law enforcement functions. At the request of the Sheriff, the Auxiliary provides boats and personnel on the water to offer assistance, particularly during busy weekends and holidays. Their primary role is to provide education and distribute printed materials to facilitate boater safety. There is no formal contractual agreement between WACO and the Coast Guard Auxiliary Flotilla. For the past 4-5 years, enforcement of park and reservoir rules has been augmented by volunteer State Police who work covertly on the reservoir. They have the authority to cite boaters for rule infractions, such as those related to safety and alcohol use. This service is provided to WACO at the discretion of the volunteers and no formal contract exists. In addition, enforcement is also provided by the Sheriff's Mounted Posse on summer weekends. The Mounted Posse patrols the park grounds on horseback and provides general assistance and information. This service is also provided to WACO at the discretion of the Mounted Posse with no formal contract. Collectively, these providers maintain a high level of visibility at the reservoir, which lessens the potential for user conflict (pers. comm., C. Wayland, 2002).

3.12.2 Environmental Consequences

Impacts to police, fire, and emergency services, currently provided to the park by Washington County Sheriff's Department, Gaston Rural Fire District, and additional supplementary sources, would occur under all three alternatives. It is likely that an increase in the supply of recreation facilities, including associated public facilities and utilities, would result in greater use and thus a need for additional law enforcement, fire protection, and emergency services.

Public utilities and services at Scoggins Valley Park and Henry Hagg Lake are primarily associated with recreation facilities in the park. Impacts to public utilities and services would also occur under each of the three proposed alternatives. However, expected increase in use would be accommodated by new and expanded facilities as proposed in each of the alternatives.

3.12.2.1 Alternative A - No Action - Continuation of Existing Management Practices

In all alternatives, current agreements with law enforcement, fire protection, and emergency services would be maintained and expanded to meet the needs of expanded facilities and use. For example, the addition of camping at Recreation Area A East would require additional enforcement, likely both internal (WACO parks staff) and external (Sheriff). Alternative A proposes providing 24-hour staff presence at the proposed campground, which would be a beneficial impact. Alternative A includes provisions to buffer parking lots and facilities with plantings for habitat enhancement and to improve visual quality. Although an appropriate measure, this strategy could potentially have an adverse impact to safety and law enforcement efforts by reducing visibility for patrols.

There would be significant changes to utilities under Alternative A. The addition of facilities at Recreation Area A East including 70 campsites (40 of which would be RV sites), and a new restroom facility at Recreation Area A West would likely require expansion of existing electrical, water, and

wastewater utilities. An RV dump site and showers at the existing buildings are proposed for Recreation Area A East as well. These two areas are currently supplied with water from the HUWC system and have a shared functioning septic drain field. The current capability of these utility systems to provide for greater use would need to be analyzed and likely increased.

A new vault restroom and a new groundwater supply are proposed for the Scoggins Creek Picnic Area. Recreation Area C would receive a new restroom and additional facilities, such as a group picnic area. This area is currently supplied with water from groundwater wells and has a functioning septic drain field. The Recreation Area C Extension would receive potable water from the well system at Recreation Area C, and a new restroom would be located there. Increased use in Recreation Area C and the Extension area could overload the capacity of these systems; therefore, the current capability of these utility systems during peak use times would also need to be analyzed and likely increased.

Mitigation Measures and Residual Impacts (Alternative A)

In general, for all expanded recreation areas in the park, ongoing monitoring of public service needs would help indicate when additional services are required. WACO or Reclamation do not maintain any financial contracts with providers for fire suppression, law enforcement, or emergency services. However, the Washington County Sheriff is funded by the Oregon State Marine Board for enforcement activities on the reservoir. WACO should investigate additional sources of funding as enforcement needs increase. For example, in addition to fees generated from a new campground, other revenues (including State grants and tax funds) could provide for additional enforcement needs. Residual impacts are discussed above.

Cumulative Impacts (Alternative A)

Continued regional population growth and expansion of recreation facilities to provide for an increase in visitor use would have a long-term effect on public service providers and resources. Specifically, this growth will add to the response demands of local fire suppression services, emergency medical, and law enforcement. If undeveloped private lands surrounding the park undergo development in the future, additional pressure from the area will be put on the providers of these services.

Utilities within the park would be significantly impacted, most of them being rendered useless, if the reservoir level were raised. If the pool level were raised 40 feet above the current normal pool level, a significant percentage of existing recreation areas and their facilities and utility systems would be inundated, requiring mitigation in other areas of the park. Water supply systems (including well, surface water, and public utility), wastewater systems (primarily septic), and electrical systems would need to be re-routed or relocated.

3.12.2.2 Alternative B - Minimal Recreation Development with Resource Enhancement

In general, impacts to enforcement and emergency services, based on proposals within Alternative B, would be similar though less than those discussed for Alternative A. This would be due to the lower level of proposed recreation development in Alternative B, assuming use would correlate with supply – not demand – of facilities.

Specific impacts of Alternative B would be the same for Alternative A, except for the following. Alternative B includes proposals related to habitat enhancement projects that may conflict with boater safety. For example, the placement of large woody debris in habitat restoration projects could result in an adverse impact to boater navigation and the need for additional reservoir patrols. Any such enhancement measures would be reviewed for compatibility with boater safety.

Impacts to utilities would also be lower in Alternative B than in Alternative A. Under Alternative B, no camping or RV dump station is proposed at Recreation Area A East; thus, less impact on the level of utilities required at that location compared to the other alternatives. A proposed boat dump station would require sanitary disposal services at Recreation Area A West that are currently not required. A restroom is proposed at Recreation Area C (same as Alternative A) that would likely utilize the existing septic system. Impacts to the existing septic system could result if use of the site increases greater than planned. There is no development at all at the Cove Area adjacent to Recreation Area C (i.e., the Extension area) in Alternative B, thus having no impact regarding utility requirements and maintenance compared to the other alternatives. Likewise, no additional changes are proposed for the Sain Creek or Elks Picnic Areas, reducing any potential impacts associated with use and the requirement for additional utilities at those sites. However, if recreation use increases at a rate greater than expected and, as proposed under this alternative, there have been fewer facilities developed, the capacities of water, electrical, solid waste, and wastewater systems might become stressed or fail.

Mitigation Measures and Residual Impacts (Alternative B)

In general, mitigation measures under Alternative B would be similar to those discussed under Alternative A, although to a lesser extent due to a lower level of proposed recreation development and use in Alternative B. Alternative B also proposes the continuation of current services and the review of proposed facilities regarding safety and emergency services access. In addition, utility systems would be updated or added as appropriate during the planning and design of specific improvement or expansion projects at recreation sites. Residual impacts are similar to those discussed in Alternative A.

Cumulative Impacts (Alternative B)

Cumulative impacts under Alternative B would be similar to those discussed under Alternative A.

3.12.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

In general, impacts to enforcement and emergency services, based on proposals within Alternative C, would be similar though greater than those discussed in the previous two alternatives due to a higher level of proposed recreation development. Specific impacts of Alternative C to public services are the same for Alternative A, except for those discussed below.

Expansion of facilities, including the addition of camping at Recreation Area A East (100 sites) and a new education & research center at Nelson Cove would likely require an increase in current services. Adverse impacts of camping on public service needs have been discussed previously for Alternative A, which proposes a campground of 70 sites. There would be cost and time availability impacts to the Washington County Sheriff, which would need to add these areas to patrol rounds made at the park. The likelihood that emergency medical services and fire suppression would be required at these sites is

greater compared to their current undeveloped condition. Addition of a camp host at Area A East would aid in the enforcement of park rules.

Impacts to utilities would also be higher in Alternative C than in the previous two alternatives. Specific impacts of Alternative C to utilities would be the same for Alternative A except for those discussed below.

Under Alternative C, camping, including an RV dump station, is proposed at Recreation Area A East (similar to, but larger than, Alternative A). The likelihood of impacts associated with utility system overload (such as the septic wastewater system) due to a greater level of use is greater in this alternative compared to the other two. A boat dump station is proposed at Recreation Area A West (similar to Alternative B), which would require sanitary disposal services not currently required. Development of the education & research center would require new facilities to be brought to the site. It is possible that because new demands are placed on groundwater supply, shortages might exist during the peak use season if water saving technology were not implemented. If inadequate utilities are provided for facilities that are developed or expanded, the capacities of water, electrical, solid waste, and wastewater systems might become stressed.

Mitigation Measures and Residual Impacts (Alternative C)

In general, mitigation measures under Alternative C would be similar to those discussed under Alternative A, although to a greater extent due to a higher level of proposed recreation development and use compared to the other two alternatives. Residual impacts are similar to those discussed in Alternative A.

Cumulative Impacts (Alternative C)

Cumulative impacts under Alternative C would be similar to those discussed under Alternative A.

3.13 Environmental Justice

This section addresses impacts associated with the alternatives and on environmental justice issues in the vicinity of Henry Hagg Lake.

3.13.1 Affected Environment

Executive Order 12898 (Environmental Justice, 59 Fed. Reg. 7629 [1994]) requires each Federal agency to achieve environmental justice by addressing "disproportionately high and adverse human health and environmental effects on minority and low-income populations." The demographics of the affected area are examined to determine whether minority populations, low income populations, or Indian Tribes are present in the area impacted by a proposed action. If so, a determination must be made as to whether the implementation/development of the proposed project may cause disproportionately high and adverse human health or environmental effects on the minority or low income populations present. Examination of minority and low income populations is warranted through the adoption of a 1994 directive designed specifically to examine impacts to such things as human health of minority populations, low income populations, and Indian Tribes and is commonly known as Environmental Justice.

The Council on Environmental Quality (CEQ) defines "minority" to consist of the following groups: Black/African American, Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaskan Native, and Hispanic populations (regardless of race). Additionally, for the purposes of this analysis, "minority" also includes all other non-white racial categories within the 2000 Census such as "some other race" and "two or more races." The Interagency Federal Working Group on Environmental Justice (IWG) guidance states that a "minority population" may be present in an area if the minority population percentage in the area of interest is "meaningfully greater" than the minority population in the general population. CEQ also defined "low income populations" based on the annual statistical thresholds from the Bureau of the Census. These "poverty thresholds" are calculated by family size and composition and are updated annually to reflect inflation. A population is considered low income if the percentage of the population that is below the poverty threshold within the area of interest is "meaningfully greater" than the low income population in the general area (state-wide) population.

The resource management planning and NEPA environmental review process for the Henry Hagg RMP complies with Executive Order 12898 by identifying minority and low income populations early in the process and incorporating the perspectives of these populations into the decision-making process.

Nearly 79% of the population of Washington County is white; thus, the potentially affected minority population in this region includes African American (5.6%), Indian/Alaska Natives (1%), Native Hawaiian and other Pacific Islanders (0.4%), Asians (5.7%), and mixed and other races (8%) (figures have been rounded to the nearest tenth). Hispanics (of any race) make up about 7.5% of the county population. The income of approximately 12.7% of the county population is less than the poverty level compared to 11.6% for the state.

3.13.2 Environmental Consequences

Statistics have not been compiled on the race or ethnicity of users of Henry Hagg Lake. It would be logical to assume that the users reflect the makeup of the population of Washington County and the nearby Portland metropolitan area. Implementation of any of the three alternatives would have no effect to environmental justice concerns. Camping at Recreation Area A East under Alternatives A and C would require a user fee that would be set by WACO according to their guidelines. While no minority group would be disproportionately affected, in general, lower income families or individuals would be affected by fees to a greater extent than middle or upper income groups. The campground fees would be set at a customary rate according to WACO guidelines.

3.13.2.1 Mitigation and Residual Impacts

No mitigation measures are proposed for any of the alternatives because no impacts would occur to environmental justice concerns from their implementation. Residual impacts are discussed in the preceding narrative.

3.13.2.2 Cumulative Impacts

There would be no cumulative impacts to environmental justice issues.

3.14 Cultural Resources

3.14.1 Affected Environment

3.14.1.1 Historical Overview

Human occupation of the Willamette Valley is well documented to have occurred since approximately 6,000 years before present (BP), but most likely extends back to no less than 11,000 years BP. At the time of Euro-American explorations of the lower Willamette Valley in the early 1800s, the Tualatin Valley was the homeland of the Tualatin Indians. The Tualatin were the northernmost branch of the Kalapuyan peoples who occupied the Willamette Valley. The Tualatin practiced a lifeway that involved seasonal movements throughout a territory that extended from the valley bottom up into the Coast Range Mountains, ensuring access to the riverine, valley bottom, and montane zones and their associated resources. In the wintertime, the population collected in groups to live in semi-permanent villages in the valley bottom. In the summer and fall, the larger groups split into family groups who moved into the Coast Range to fish, hunt, and gather nuts and berries. Research indicates that the area from modern-day Gaston to Forest Grove was a center of Tualatin Tribal settlement, including a winter village near the mouth of Scoggins Creek and perhaps another only a few miles upstream. No record exists of settlements in the Scoggins Valley within the area inundated by Henry Hagg Lake. It is likely, however, that people residing in the winter villages downstream of the reservoir would have at least used the Scoggins Valley area in the summer and fall.

British and Americans first began to explore the lower Columbia River in 1792. Soon afterward, devastating epidemics swept through the lower Willamette Valley and along the Columbia. Following an epidemic in 1829, John McLaughlin estimated that 90% of the resident lower river and valley tribal people had died. The Tualatin were among those people. Soon after, the life of the survivors was further altered by intensive settlement of the region by Euro-Americans.

Euro-American settlement occurred rapidly once the riches of the land became known. In the 1820s, fur posts and agricultural settlements were established in the lower Willamette Valley. By the early 1830s, a number of farms had been established by former fur trappers in the lower valley. In 1840, four fur trader families settled on the Tualatin Plains. In 1841, American emigration to the Willamette Valley began in earnest, and by 1843 overland emigrants settled the remainder of the Tualatin Plains.

In 1851, the U.S. Government began treaty negotiations with remaining Willamette Valley Indian Tribes. The Government's goal was to move the Tribes east of the Cascades, but the Tribes ultimately negotiated small reservations in the Willamette Valley in exchange for ceding all other valley lands. Although Tribes moved to the negotiated locations, Congress failed to ratify those treaties due to pressure from Americans who wished to settle those lands. Soon thereafter, all valley Indians were rounded up and placed on a reservation on less-desirable lands on the Yamhill River. In 1854, further negotiations occurred, resulting in a treaty ratified in 1855. The Grand Ronde and the Siletz reservations were subsequently created, and most of the surviving Tualatin were moved to those locations in the late 1850s.

3.14.1.2 Archeological Investigations

In 1965, prior to construction of Scoggins Dam and Henry Hagg Lake, the University of Oregon completed an archeological survey of the reservoir and downstream impacts areas. Investigations are

reported in Cole and Rice (1965). The contract was issued by the NPS, on Reclamation's behalf. The survey methods and scope are uncertain, but the fieldwork appears to have focused on areas along Scoggins Creek and its tributaries within the proposed reservoir area. Local residents were also contacted regarding the presence of artifacts and other deposits. Four prehistoric archeological sites were recorded, all based on information from local residents. Two sites, 35-WN-2 and 35-WN-3, were reported to have been circles of river cobbles thought by landowners to have been sweat lodges. Both had been plowed, removing the cobbles. Site 35-WN-1 was a location where the landowner had reported collecting projectile points, scrapers, and a mortar. This site was recorded without ground-truthing to confirm the report. All three of these sites were located within the projected reservoir pool area. The last site, 35-WN-4, was recorded well downstream of the reservoir.

In 1969, the NPS contracted with Oregon State University for additional surveys and for test excavations. The investigations are reported in Davis (1970). Davis determined 35-WN-2 and 35-WN-3 to be not eligible to the National Register based on surface examination. He proposed to conduct test excavations at 35-WN-1 and 35-WN-4. The landowner denied permission to access site 35-WN-1. There is no evidence that any further investigation occurred before this location was inundated by the reservoir. Davis was able to complete test excavations at 35-WN-4, which yielded artifactual material in a midden context dating to the Late Archaic period (200 to 2,000 years BP). Although the site was recommended to be eligible to the National Register, there is no evidence that any further investigation occurred. It is possible that the site lay beyond the impact zone for any project-related development. Davis also recorded a fifth site, a petroglyph, well downstream of the reservoir.

Although not documented by the archeologists, one historic-period cemetery site was located in the valley. The annual project history (Reclamation 1971/1972) indicates that, in August 1971 "Eleven graves of an unknown pioneer group were excavated from the tunnel outlet, and the remains were reinterred in Mountain View Cemetery in Forest Grove, Oregon." Other than a photograph of the cemetery site showing the 11 burial pits, there is no other information offered in the project history.

In the early 1990s, a Reclamation archeologist completed supplemental surveys at the Sain Creek Picnic Area, Recreation Area C, and Scoggins Creek Picnic Area in advance of trenching and grading to implement improvements in those locations. Despite excellent visibility, no artifactual material or sites were found. In 1993, WACO contracted with Archaeological Investigations Northwest, Inc. (AINW) for additional surveys at recreational areas where they proposed further improvements under their recreational development master plan. AINW surveyed a total of 106 acres in seven locations (Elks Picnic Area; Sain Creek Picnic Area; Recreation Area C; Scoggins Creek Picnic Area; the southern-most development area at Recreation Area A West; Recreation Area A East; and the location where a fee booth pullout was to be constructed). The area surveyed at Recreation Area C extended much farther upstream than the existing development area. AINW found no artifactual material or sites and concluded that there was little probability that undetected subsurface sites were present. They recommended that no further investigations were needed prior to development (Ellis 1993).

In 2001, Reclamation began scoping actions in preparation for the Henry Hagg Lake RMP. The scoping actions included an assessment by Reclamation of whether additional cultural resources investigations were needed to assess impacts of alternatives identified in the RMP EA. Assessment indicated that most locations where development or focused use is being considered had been resurveyed in the 1990s by Reclamation staff or AINW and needed no further investigations to prepare the RMP EA. Areas that

were not resurveyed in the 1990s were the existing elk meadows, potential new elk meadows, segments of the reservoir trail outside of the recreation areas, one existing recreation area, and the proposed site for the education & research center. Reclamation determined that any necessary resurvey of existing or potential elk meadows could be deferred until RMP implementation, because potential ground disturbances are likely to be limited to discing the soil to plant grass. These locations have been farmed in the past. It was determined that supplemental survey of trail segments could also be implemented under the RMP, since specific clearances would be needed in association with any new construction.

The recreation use area that hadn't been resurveyed is the uphill portion of Recreation Area A West. This is an existing recreational site, where facilities were constructed in the 1970s. Due to extensive ground disturbance that occurred during the original recreational development, Reclamation determined there is no potential for intact cultural resources. Therefore, no supplementary survey is needed for the RMP.

Reclamation determined that the proposed site for the education & research center did need to be resurveyed as part of RMP preparation, because implementation of the Proposed Action would involve extensive ground disturbance in areas where past disturbance was limited to plowing and timber cutting. Therefore, in April 2002, Reclamation contracted with AINW to survey a 69-acre area that may be affected if the education & research center were constructed. AINW completed the survey and recorded two 20th Century dump sites (35-WN-49 and 02/801-3) and one lithic scatter (35-WN-50). Later in April, they returned to excavate shovel test probes at the lithic scatter to determine if the site might have subsurface components that would make it eligible to the National Register. They also excavated probes in areas where the surface visibility had been very poor, perhaps preventing surface detection of sites.

Results of the survey and test probing are reported in Ellis and Fagan (2002). In brief, the probing of densely vegetated areas failed to produce artifactual material. Dump site 35-WN-49 consists of approximately 70 to 100 items scattered in an area about 5 by 15 meters in size. The materials are a mix of agricultural and domestic refuse primarily dating from after WWII. It seems to represent either a single episode of deposition or a series of deposits over a short period of time. It is characteristic of small dumps frequently found in rural areas, and has little potential to provide additional or significant information about past occupation of the area.

Site 35-WN-50 was recorded as a scatter of seven flakes, one possible core, and an additional possible flake scattered along a 150-meter long segment of a dirt trail. AINW also noted one fragment of what may have been burned bone and a large river cobble that would had to have been transported to the location. When they returned, they recorded four additional flakes and a biface fragment but could not relocate all of the previously recorded materials. They excavated 12 shovel probes, one of which yielded a single flake from a disturbed context. Soils are shallow, with decaying bedrock encountered at about 30 cm below surface. The biface fragment is the distal end of a dart point but is not temporally diagnostic.

AINW recommended that both sites 35-WN-49 and 35-WN-50 be considered not eligible to the National Register, as neither had the potential to yield significant new information about past lifeways in the valley or region. Reclamation agreed with those recommendations. On August 19, 2002, Reclamation initiated consultation with the State Historic Preservation Officer (SHPO) on the eligibility of those sites

to the National Register. On September 12, 2002, the SHPO concurred that 35-WN-49 and 35-WN-50 are not eligible to the National Register.

Site 02/801-3 is a dump or scatter of historic-period debris. The 15-mile shoreline Master Trail passes through this site, and debris is visible along both sides of the trail. Much of the visible debris is structural material (brick fragments, a chunk of concrete, window glass) and domestic material (ceramic and bottle glass fragments). It was difficult to determine the age of much of the material, but one ceramic fragment was of a feather-edge flow blue design. This style was most common from ca. 1800 to the 1840s. Additional research is needed to determine the source of the debris. U.S. Geological Survey (USGS) topographic sheets dated 1941 and 1956 show a building very near this location, and Reclamation appraisal records document an additional home in the vicinity. Insufficient information is currently available to determine if site 02/801-3 is eligible to the National Register. Reclamation does not propose to complete further research during RMP preparation.

3.14.1.3 Traditional Cultural Properties (TCPs)

As discussed above, the study area lies within the home area of the Tualatin band of the Kalapuya Indians. As part of the NEPA scoping process for the RMP, Reclamation notified the Confederated Tribes of the Grand Ronde Community of Oregon and the Siletz Tribe of our intent to prepare an RMP for the reservoir lands. The Tribes were asked to inform Reclamation if they were aware of any cultural resources or TCPs that might be in the study area or impacted by the Proposed Action. Reclamation indicated that we would be pleased to meet to discuss the RMP planning process or any concerns they might have about impacts on resources important to the Tribes. The notifications occurred in letters dated January 15, 2002. No response has been received to date. Therefore, at this time Reclamation is unaware of any TCPs that might be present at the reservoir.

3.14.2 Environmental Consequences

Archeological sites are very fragile. Much of a site's scientific value lies in maintaining the original vertical and horizontal spatial relationship of all artifacts. Therefore, any event or action that disturbs the soil or strips away vegetation can damage or destroy that spatial relationship, and also can expose artifacts to looters. Although Reclamation has not yet been informed if TCPs are present, it can be assumed that uses that damage vegetation or disturb soils may harm these kinds of resources.

A limited potential to adversely impact cultural resources exists under all three alternatives. Impacts could occur from soil and vegetation disturbance from construction of recreational improvements and from habitat and wildlife management actions. The trend of increased recreational use of land is likely to increase soil disturbance, and associated resource impacts, over time. However, the likelihood of damage to cultural resources is very limited because few sites have been recorded, and none are in or near focused recreational development.

Actions under the alternatives would also aid historic preservation. All alternatives include programmatic cultural resource management actions as needed to fully comply with the National Historic Preservation Act (NHPA), as outlined in Chapter 2. All alternatives presume application of preservation and mitigation measures defined in Chapter 2 and in BMPs described in Chapter 5. Implementation of these measures would avoid or reduce potential impacts to cultural resources from all authorized uses.

Where impacts cannot be avoided, the alternatives all include the commitment to mitigate adverse impacts to Register-eligible historic properties.

3.14.2.1 Alternative A - No Action Alternative - Continuation of Existing Management Practices

Elk meadow rehabilitation that involves ground-disturbing actions could damage cultural resources, if such properties were present. If rehabilitation actions were limited to disking existing meadow areas, impacts would be limited to an incremental increase in soil disturbance within the existing plow zone and perhaps additional damage to artifacts. If improvements occurred that involved trenching or other disturbance below the old plow zone, then intact soils would be churned, and the scientific integrity of associated archeological deposits would be damaged. Implementation of management commitments outlined in Chapter 2 and BMPs defined in Chapter 5 would avoid the potential adverse effects.

Weed control or vegetation thinning actions that would harm native vegetation would have an adverse impact on cultural resources if the vegetation were a contributing feature to a TCP, or if its removal caused soil disturbance within site boundaries. However, weed control actions that prevent introduced species from out-competing native species could be beneficial when the native species were TCPs.

No adverse effects are anticipated to archeological sites from proposed recreation improvements, since actions are confined to existing developed areas and no cultural sites have been identified in those locations. It is unlikely that intact, undetected archeological sites or TCPs are present in those locations due to the extensive disturbance from past construction and landscaping actions. Continued use of the reservoir trail has the potential to impact site 02/801-3. The trail passes very near or through the site. Artifacts are visible along the trail and could be collected and carried away by trail users. Vegetation control actions necessary for trail maintenance expose artifacts in a wider area along the trail. Vegetation control or other trail maintenance actions could potentially disturb the soil associated with the archeological deposits. If other sites are present along the unsurveyed portions of the existing trail, they could be subject to similar relic collection and maintenance-induced impacts.

Mitigation Measures and Residual Impacts (Alternative A)

The NHPA considers adverse effects upon a National Register eligible site to be an impact that requires mitigation, regardless of the severity of the impact. If site 02/801-3 proves to be an eligible site, then site protection or mitigation actions would be required. Reclamation would use processes defined in Chapter 2 to address impacts to this site and any others identified in the future. If the avoidance measures were implemented, it is likely there would be no residual impacts. If impacts could not be fully avoided, then there might be residual impacts. Archeological data recovery actions are rarely sufficient to collect all of the potential information from a site. Not all traditional cultural values inherent in a TCP may be restorable, either due to the nature of that value, or due to cost.

Cumulative Impacts (Alternative A)

Recreational visitation is expected to continue to increase in coming years. This might impact cultural resource sites in several ways. More people are likely to use the trails and the unimproved shoreline or upland areas for dispersed recreational purposes. This would increase the potential for relic collection at sites that may be in those locations. If the dam raise were to occur, it would inundate new areas, and perhaps trigger slope erosion above the new shoreline. However, examination of topographic sheets

shows that only very limited additional lands would be inundated, and that those are in narrow and steep locations that likely have limited potential to contain archeological sites. Specific analysis of cultural resource impacts from the dam raise will occur as part of that separate study.

3.14.2.2 Alternative B - Minimal Recreation Development with Resource Enhancement

Impacts from implementation of Alternative B would be similar to those described under Alternative A, except as noted below.

Planting woody species in riparian zones of Tanner and Scoggins Creeks would cause ground disturbance that might impact cultural resources, if such are present. Although planting might simply entail pushing small starts into the ground, the root mass that grows as a result can have very damaging impacts to archeological site deposits. Ground disturbance from construction of a cofferdam at Tanner Creek to enhance wetlands could damage or destroy sites, if present.

A benefit would occur from integration of educational materials about area pre-history and history in public interpretive programs. The public would gain additional understanding of the value of cultural resources and the need to preserve them for future generations.

Mitigation Measures and Residual Impacts (Alternative B)

Same as for Alternative A.

Cumulative Impacts (Alternative B)

Cumulative impacts would be similar to those described under Alternative A.

3.14.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

Impacts under Alternative C would be similar to those of Alternative A, except as noted below.

Construction associated with installation of a cofferdam at Nelson Cove could impact cultural resources, if such were present. A benefit could occur from construction of the education & research center, as it would increase the opportunities to inform the public about regional pre-historic and historic resources and the need to preserve them for posterity. However, site 02/801-3 is located near the proposed center. Focusing intensive public use in the area could increase the potential for relic collection on the site.

Construction of walking trail extensions and an equestrian trail could damage cultural resources, if they were located in the construction impact area. There is little likelihood that intact cultural resources are present where those trail enhancements would occur immediately adjacent to the existing road because of disturbance caused during original road construction. Where the trails cross less disturbed areas, however, there could be construction-caused damage to as-yet undocumented sites. Also, construction of the trails may cause users to explore areas that currently receive little public use. If sites are present in those areas, they might be impacted by relic collection activities.

Mitigation Measures and Residual Impacts (Alternative C)

Same as for Alternative A.

Cumulative Impacts (Alternative C)

Cumulative impacts would be similar to those described under Alternative A.

3.15 Indian Sacred Sites

Indian sacred sites are defined in Executive Order 13007 as “any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian Tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the Tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such as site.” Federal agencies are required, to the extent practicable, to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sites.

3.15.1 Affected Environment

As discussed in Section 3.14 (Cultural Resources), the study area lies within the home area of the Tualatin band of the Kalapuya Indians. The Tualatin were moved onto the Grand Ronde or the Siletz Reservations in the 1850s. As part of the NEPA scoping process for the RMP, Reclamation notified the Confederated Tribes of the Grand Ronde Community of Oregon and the Siletz Tribe of our intent to prepare an RMP for the reservoir lands. The Tribes were asked to inform Reclamation if they were aware of any Indian sacred sites that might be impacted by the Proposed Action. Reclamation indicated that we would be pleased to meet with the Tribes to discuss the RMP planning process or any concerns they might have. The notifications occurred in letters dated January 15, 2002. As of this time, no response has been received. Therefore, at present Reclamation is unaware of any Indian sacred sites at the reservoir.

3.15.2 Environmental Consequences

As no sacred sites have been reported at the reservoir, no potential impacts are identified at this time under any of the alternatives.

3.15.2.1 Mitigation Measures and Residual Impacts

Reclamation recognizes that undisclosed sacred sites may be present. Therefore, Reclamation will consult the appropriate Tribes in advance of new actions on reservoir lands that appear to have the potential to prohibit access to or might damage a sacred site, if one were present. If, in the future, any sacred sites are disclosed, then Reclamation will determine if there are impacts from existing land uses. If sacred sites were present and if they would be adversely impacted, then Reclamation would avoid damaging the sites. However, the avoidance can only be accommodated while still accomplishing Reclamation’s mission and when the actions were within agency authority. Residual impacts would occur if Indian sacred sites are found and endangered from existing uses or proposed new developments and impacts cannot be avoided.

3.15.2.2 Cumulative Impacts

Recreational visitation is expected to continue to increase in coming years. If Indian sacred sites are present, this might impact those sites in several ways. People using the site location might inadvertently damage natural or cultural features that are important to the sacred nature or continued use of the location

for traditional religious purposes. Increased density of recreational use might also unintentionally intrude upon the privacy that is necessary or desirable when practicing traditional religious activities.

3.16 Indian Trust Assets

3.16.1 Affected Environment

Reclamation has an established policy to protect Indian Trust Assets (ITAs) from adverse impacts of its programs and activities and to enable the Secretary of the Interior to fulfill responsibilities to Indian Tribes. ITAs are legal interests in property held in trust by the United States for Indian Tribes or individuals. Examples of ITAs include lands, minerals, hunting and fishing rights, and water rights. ITAs can be found both on-reservation and off-reservation. The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian Tribes or individuals by treaties, statutes, and executive orders.

The Confederated Tribes of the Warm Springs Reservation (Warm Springs Tribes) reserved the right to take fish at all usual and accustomed places through the June 25, 1855, Treaty with the Tribes of Middle Oregon. These usual and accustomed places include the lower Willamette River Valley. No other ITAs have been identified in the study area. Letters requesting information on possible ITAs have been sent to the Confederated Tribes of Grand Ronde Community of Oregon and the Confederated Tribes of Siletz, dated January 15, 2002, but no responses have been received to date.

3.16.2 Environmental Consequences

None of the alternatives would affect ITAs.

3.6.2.1 Mitigation Measures and Residual Impacts

No mitigation measures are necessary; there are no residual impacts under any of the proposed alternatives.

3.6.2.2 Cumulative Impacts

There are no cumulative impacts to ITAs under any of the alternatives.

3.17 Transportation and Access

3.17.1 Affected Environment

The majority (76%) of visitors to Henry Hagg Lake and Scoggins Valley Park reside in the nearby communities of Forest Grove, Hillsboro, Beaverton, and Portland and travel less than 50 miles to the park (Titre and Ballard 1999). Primary vehicle access to the park is by way of Highway 47, which junctions with Scoggins Valley Road, the main arterial of the park. Tualatin Valley Highway (Oregon Highway 8) and Sunset Highway (US 26) are feeders to Highway 47. All three highways carry heavy traffic volumes and are the primary travel routes to the park. No air rail, bus, or shuttle services are provided to or within the park. Overall, access to the park by road, access within the park by road and trail, and current signage function quite well (pers. comm., C. Wayland, 2002).

3.17.1.1 Major Arterials

Scoggins Valley Road is the primary vehicular access directly to and within the park. The road enters the park from the southeast and runs along the north and east perimeter of Henry Hagg Lake. The perimeter road on the south and west shore of the reservoir is West Shore Drive, which crosses the dam and intersects with Scoggins Valley Road northeast of the dam. These two roads provide access to the park's seven recreation areas. The Scoggins Valley/West Shore road (perimeter road) is an 11-mile, 2-way, 2-lane road. It has a paved asphalt surface with 12 to 14 foot wide lanes and 6 to 8 foot wide paved shoulders. The road has no traffic lights and one stop sign at the dam close to the park entrance. The speed limit is posted at 35 mph at the park entrance and 45 mph after the dam. Approximately 10 turnouts are located along the perimeter road. The majority are located on the lakeside and provide view access. Other turnouts provide additional parking access to trailheads.

Park visitors primarily use the perimeter road, but it also supports residential traffic, utility vehicles, and logging trucks. The road gets peak usage on weekends and holidays during summer months. The results of a 1992 traffic study which evaluated level of service (LOS) during the peak hour of an average Saturday designated Scoggins Valley Road as LOS C, which is considered acceptable (Reclamation 1994). The study also indicated that 10% of the traffic on the road consisted of heavy traffic, while 90% were passenger cars. Logging trucks did not constitute a significant volume of traffic on the weekends. A recent traffic count and studies of recreational use indicated that peak hours of usage on Scoggins Valley/West Shore Road are 7-9 a.m. and 2-3 p.m. (pers. comm., Thompson, 2001; Titre and Ballard 1999). In 2001 there were 480,186 park users, the two busiest months being May (97,347 park users) and July (95,591 park users). Due to drought conditions and low reservoir levels, the number of park users in 2001 was considerably less compared to previous years. Between 1996 and 2000, the park accommodated approximately 700,000 visitors a year (pers. comm., C. Wayland, 2002).

The perimeter road is a County Road maintained by the Washington County Department of Land Use and Transportation (DLUT). The perimeter road has been evaluated and is up to standard with regard to design, safety, and capacity. Unstable underlying soils is the biggest maintenance issue on the road, and there are ongoing maintenance efforts to correct this problem (pers. comm., C. Wayland, 2001). Other maintenance and operations issues with the perimeter road include collision and vandalism of road signs and some instances of speeding (pers. comm., Thompson, 2001).

The Washington County Sheriff's response to roads surrounding the park in 2001 was primarily related to motor vehicle accidents (pers. comm., Julian, 2002).

3.17.1.2 Local Roads

In addition to the main perimeter road, approximately 20 local roads exist within the boundaries of the park. WACO maintains eight access roads, all of which junction with the perimeter road. These include Tanner Creek, Stepien, Sain Creek, Lee, Herr, Nelson, Scott Hill, and Hankins roads. All roads are 18 to 22 feet wide, and most have stop signs at their junction with the perimeter road. Logging trucks use Tanner Creek, Stepien, Sain Creek, and Lee roads. Herr Nelson, Scott Hill, and Hankins roads primarily serve residential vehicles.

The remaining local roads are owned by Reclamation and are maintained by WACO. These roads consist of 12 to 14 foot wide single-lane gravel roads and generally do not have stop signs at their junction with the perimeter road. While these roads are intended for fire access, several easements provide more than 300 people access to their homes and properties (Washington County 1992). Multiple use of single-access permits has been a source of some contention. This issue is addressed further in Section 3.10 (Land Use).

3.17.1.3 Parking

The park has designated parking areas at each of the seven recreation areas around the reservoir. In addition, there is some parking availability along the perimeter road. Parking facilities are adequate except for approximately 10 days out of each summer season when the lots become full and people have to park on the perimeter road (pers. comm., C. Wayland, 2002). In a recent study of park users, 15.9% of respondents rated parking facilities as "excellent," 61.5% as "good," 17.3% as "fair," 2.5% as "poor," and 2.8% had no opinion (Titre and Ballard 1999).

3.17.1.4 Trails

A 10.5-mile multi-use trail runs along the reservoir on the shoulder of the perimeter road. The 6 to 8 foot wide paved lanes are located on both sides of the road and are used by bicyclists and joggers. The lanes also provide additional parking, particularly for anglers in the Sain Creek area. There have not been significant conflicts or safety issues presented by the multi-purpose function of the trail (pers. comm., C. Wayland, 2001).

A 15-mile "Master Trail" generally runs along the reservoir between the shoreline and the perimeter road. Hikers, joggers, and bikers use the 5-foot wide dirt trail, with gravel in places where the incline exceeds 8%. Twenty-eight footbridges span ravines and waterways along the trail. The Master Trail and the multi-purpose trail on the perimeter road also support special use events including running races, bicycle races, triathlons, and biathlons. Several smaller trails provide access from the perimeter road to the Master Trail. In addition, hikers have forged several unofficial trails on their own accord. For the most part, this system of unofficial trails has stabilized and no new undesirable footpaths have recently been created (pers. comm., C. Wayland, 2002).

Both trails are generally in good condition (pers. comm., C. Wayland, 2001). The only complaints regarding the paved multi-use trail along the perimeter road have been from cyclists who want the lane swept more often to clear away bark, which falls from logging trucks onto the shoulder. The Master

Trail is also in good condition, as there have been ongoing improvements to address erosion issues (pers. comm., C. Wayland, 2001). In a recent study of park users, 17.6% of respondents rated trails as “excellent,” 35.2% as “good,” 8.9% as “fair,” 0.3% as “poor,” and 38% had no opinion (Titre and Ballard 1999).

3.17.1.5 Reservoir/Boat Access

Access to the reservoir for activities such as boating, picnicking, and fishing is provided in seven areas: two recreation areas with boat ramps and picnic facilities (Recreation Area A West and Recreation Area C), three picnic areas (Scoggins Creek, Sain Creek, and Elks), the Recreation Area C Extension area, and the currently closed Recreation Area A East. Anglers access the reservoir at Elks Picnic Area, Sain Creek, and Recreation Area C. Boat access is provided by two boat ramps at Recreation Areas A and C. These ramps have concrete surfaces, and the adjacent parking lot has a hard paved surface. The Recreation Area A Boat Ramp usually fills up by 11 a.m. on weekends while the Recreation Area C Boat Ramp only fills up about six times a year. These boat launch facilities are adequate, and expanding boat launch facilities may overtax the capacity of the reservoir (pers. comm., C. Wayland, 2001). However, the current system, which relies on a series of cables and anchors to raise and lower docks to adjust for fluctuations in reservoir level, is labor intensive to operate and expensive to maintain. A new system using pilings and sliding dock sleeves is expensive but easier to operate and less expensive to maintain (as proposed in Alternatives A and B) (pers. comm., C. Wayland, 2001).

Recreation Area A East is currently not open to the public; it was closed due to vandalism and other illegal activities that were consistently occurring there. Because facilities are not directly adjacent to the water, it did not attract the number of legitimate users other recreation areas of the park did. Illegitimate users filled the void and their activities could not be contained under existing levels of law enforcement. The Sheriff thus requested that the park close this area except for special group events (pers. comm., C. Wayland, 2002).

3.17.1.6 Disability Access

The Park won the U. S. Department of the Interior’s Conservation Service Award for its development of accessible facilities. The Park continues to strive for 100% accessibility on all new and existing facilities. These facilities include:

- A 520-foot hiking and viewing trail by the Recreation Area A Boat Ramp;
- A 260 foot by 10 foot accessible fishing pier by the Recreation Area C Boat Ramp;
- Uniform accessibility throughout the park including accessible parking, picnic area, shelters, garbage cans, water fountains, public phones, and associated pathways.

3.17.2 Environmental Consequences

Impacts, both beneficial and adverse, to transportation and access would occur under each of the three alternatives. The proposals of all three alternatives provide for improved or expanded parking at several sites to meet increasing recreation demand. It is likely that an increase in the supply of recreation

resources due to these growing demands would result in greater use. With the increase in use, however, it is likely that regional feeder roads, the perimeter County Road, and roads within recreation areas will experience higher volumes of traffic from new user groups (campers, RVs users, and education & research center employees and visitors) and during longer periods of the day and season. No BMPs have been developed for transportation and access; however, specific accommodations to reduce congestion and promote safety would be determined during site-specific facility designs.

3.17.2.1 Alternative A - No Action - Continuation of Existing Management Practices

Transportation and access at the park may be affected by the increase in recreation users and the expansion of facilities that are proposed in Alternative A. Significant recreation facilities are proposed for all existing recreation areas. For example, impacts from the addition of 70 campsites to Recreation Area A East would result from the addition of another user group (campers with RVs) that does not currently utilize the day use areas of the park. It is also likely that additional traffic from camping would impact the typical use period during the day for the perimeter road. Beneficial impacts would result from proposals to improve or expand parking facilities at Recreation Area A West, Scoggins Creek Picnic Area, Recreation Area C, Elks Picnic Area, and the Recreation Area C Extension. However, it is likely that use at each of the expanded sites would increase, requiring a supporting transportation system that minimizes congestion. The most likely locations for congestion would be at the intersections of the perimeter road and recreation site access roads and between those intersections and the parking areas within recreation sites, particularly during weekends and holidays during the peak summer season. A minor beneficial impact would result from the development of trail connections to the Master (shoreline) Trail if these connections are in proximity to existing or proposed parking areas. This would encourage trail users, such as shore anglers, to use designated parking areas instead of the shoulders of existing roads which creates congestion and safety issues. All new facility design would include provisions for standard traffic safety elements.

Mitigation Measures and Residual Impacts (Alternative A)

No substantial impacts have been identified, and no mitigation measures are necessary. Residual impacts are discussed in the preceding narrative.

Cumulative Impacts (Alternative A)

If capital transportation improvements including mitigation measures (as discussed previously) accompany the expansion of recreation areas as proposed in this alternative, no cumulative impacts would result within the park or in proximity to it. However, if either inadequate capital transportation improvements or adequate mitigation measures are not identified and implemented, the issue of congestion would grow as use of the park increases. In the general vicinity of the park, increasing road use would likely accompany continued population growth throughout the region. Additional traffic would impact access to Henry Hagg Lake under any of the alternatives.

Transportation to and within the park would be significantly impacted if the reservoir level were raised. If the pool level were raised 40 feet above the current normal pool level, the perimeter road would be inundated at several locations near Elks Picnic Area, Sain Creek, Scoggins Creek, and Tanner Creek. In addition, a significant percentage of roads within the existing recreation areas would also be inundated.

3.17.2.2 Alternative B – Minimal Recreation Development with Resource Enhancement

Transportation and access at the park may be affected by the increase in recreation users and the expansion of facilities proposed in Alternative B. However, less recreation development is proposed in this alternative than the other two alternatives. In general, the impact of this alternative's proposals on transportation and access is thus less than the other two alternatives. Specific impacts of Alternative B are the same for Alternative A, except for those discussed below.

Minimal facilities are proposed for existing recreation sites. However, the lack of proposed new parking at existing recreation sites may become a minor adverse impact if demand and use continue to grow and current parking isn't adequate. Safety from crowding and erosion and vegetation damage from dispersed use could result. Facilities would include standard traffic safety designs; therefore, no impacts are anticipated.

Mitigation Measures and Residual Impacts (Alternative B)

No substantial impacts are identified, and no mitigation measures are necessary. Residual impacts are discussed above.

Cumulative Impacts (Alternative B)

Cumulative impacts under Alternative B would be similar to those discussed under Alternative A.

3.17.2.3 Alternative C - Moderate Recreation Development with Resource Enhancement (Preferred Alternative)

Transportation and access at the park may be affected by the likely increase in recreation users and the expansion of facilities proposed in Alternative C. The highest level of recreation facility expansion is proposed in this alternative and applies to all existing recreation areas in the park. In general, there is a higher level of potential impacts to transportation and access resources in this alternative compared to the other two alternatives. Improved or expanded parking is proposed at several recreation sites and will result in the same beneficial and adverse impacts that were discussed previously in Alternative A. Other specific impacts of Alternative C are the same for Alternative A, except for those discussed below.

Development of the education & research center at Nelson Cove would generate traffic from a large user group (primary and secondary school students, teachers, and support staff) that does not currently use roads to and within the park. Design of the parking facilities would need to safely accommodate this amount of traffic, and consideration should be given to safety of staff and users, and provisions for proper traffic flow. Likewise, the addition of 100 campsites to Recreation Area A East would also attract a user group (campers with RVs) that does not necessarily utilize the day use areas of the park. The addition of a new parking and staging area for proposed equestrian trail use at the park would also generate more traffic from a new user group. Any such facility would need to be designed to accommodate trucks with horse trailers.

Primary access to and through the park is via the County Road (Highway 47) and is currently unrestricted. Alternative C proposes investigating the concept of controlling access to better collect fees (visitors currently have to pull off the road and voluntarily pay user fees) and monitor visitor use. Adverse impacts include cost and congestion at the entry points, particularly during peak use periods.

The latter impact would be more significant for local residents and their visitors and service personnel who would have to pass through controlled access on a frequent basis.

Widening the shoulder of the perimeter road for pedestrians and bicycles would have a beneficial impact with regards to safety and traffic flow. Likewise, routing the Master (shoreline) Trail entirely off of the road (the trail utilizes the road shoulder in several locations) would lead to the same beneficial impacts. All new facilities would include standard traffic safety designs; therefore, no transportation impacts are anticipated.

Mitigation Measures and Residual Impacts (Alternative C)

No mitigation measures are necessary. Residual impacts are discussed in the preceding narrative.

Cumulative Impacts (Alternative C)

Cumulative impacts under Alternative C would be similar to those discussed under Alternative A.

4.0 Consultation and Coordination

4.0 CONSULTATION AND COORDINATION

4.1 Public Involvement

Reclamation's approach to preparing the RMP and associated Draft EA was to involve the public, particularly by developing a dialogue with local stakeholder groups. The goal of the public involvement process was to make sure that all stakeholders, including the general public, have ample opportunity to express their interests, concerns, and viewpoints, and to comment on the plan as it was developed. By fostering two-way communication, Reclamation was also able to use the talents and perspectives of local user groups and agencies during the alternatives development process.

Reclamation's public involvement process involved five key components:

- **Newsbriefs** - A newsletter was initially mailed to more than 350 user groups, nearby residents, and agencies. The mailing list is continuously expanded as more interested parties are identified. Three newsbriefs have been released with one more scheduled upon completion of the Final EA and RMP.
- **Public Meetings/Workshops** – Two public meetings are included in the RMP planning process. One was held prior to the release of this Draft EA. The final public meeting is scheduled for May 2003 to take public comments on the Draft EA. Public meetings are held in Hillsboro, OR.
- **Ad Hoc Work Group** – This group consists of approximately 21 representatives from interested groups and agencies. They have met three times throughout the RMP development process to identify issues and assist with RMP update and alternatives development. One additional meeting is scheduled.
- **RMP Study Web Site** – The newsbriefs, draft materials, and meeting announcements are continuously updated at a dedicated website on Reclamation's Pacific Northwest site: www.pn.usbr.gov.
- **News Releases** – Periodically, Reclamation prepares news releases for distribution to local news media. Such news releases generally result in press coverage of the RMP process.

In December 2001, the first newsbrief introduced the RMP process, announced the public meeting, and provided a form for submitting issues and initial comments on the management and facilities at Henry Hagg Lake. Approximately 15 of these response forms were returned. The results of the mail-in response form and the issues raised at the first public meeting were summarized in the second newsbrief, mailed August 2002. The issues were listed in a table with the number of responses for each issue. The third newsbrief was mailed in April 2003 and provided an update of the Ad Hoc Work Group process and announced the Draft EA and second public meeting. The fourth newsbrief will be mailed out in December 2003 when the Final EA and RMP are complete.

The first public meeting was held on January 17, 2002 in Hillsboro. The purpose of this meeting was to conduct public scoping of the issues at Henry Hagg Lake. Approximately 30 people attended the meeting. Reclamation provided information about the RMP planning process, then the participants broke into small work groups to discuss important issues and opportunities the RMP should address.

The Ad Hoc Work Group met in February, May, September, 2002, and will meet in June 2003. As part of the May 2002 meeting, the group spent a day touring the Henry Hagg Lake study area and becoming more familiar with the issues. The 21 members were of considerable assistance in the alternatives development process. A wide variety of viewpoints was included in the group. The Preferred Alternative was arrived at through Ad Hoc Work Group discussions, and the recommendations of agency specialists and planners. The entities represented in the Ad Hoc Work Group are listed in Table 4.1-1.

Table 4.1-1. Ad Hoc Work Group.

Adjacent Land Owner	Oregon State Marine Board
Clean Water Services	Oregon Road Runners Club
Coast Guard Auxiliary	Portland State University Center for Lakes and Reservoirs
Gaston Fire Department	Portland Urban Mountain Pedallers
Joint Water Commission Water Treatment Plant	Trout Unlimited and Tualatin River Watershed Council
Mazamas	Tualatin Valley Irrigation District
Marine Patrol	U.S. Fish and Wildlife Service
NW Outdoor Science School	Washington County Board of Commissioners
Oregon Bass and Panfish Club	Washington County Parks and Recreation Advisory Board
Oregon Department of Fish and Wildlife	Washington County Parks Department
Oregon Equestrian Trails	

4.2 Agency Consultation and Coordination

Reclamation consulted with several Federal and local agencies throughout the RMP process to gather valuable input and to meet regulatory requirements. This coordination was integrated with the public involvement process.

4.2.1 Fish and Wildlife Coordination Act

Reclamation has consulted with and arranged for the U.S. Fish and Wildlife Service (USFWS) to provide a Planning Aid Memorandum (PAM) (Appendix C) under authority of the Fish and Wildlife Coordination Act (FWCA). Recommendations contained in the PAM have been incorporated in the final Preferred Alternative and evaluated in the Final EA.

4.2.2 Endangered Species Act

The evaluation of endangered species contained in this Draft EA serves as Reclamation's biological assessment as required under the Endangered Species Act (ESA). It evaluates impacts to listed and proposed for listing species including bald eagles, Oregon spotted frog, western pond turtle, and a

number of plant species. Reclamation has determined that the Preferred Alternative will not affect any of these species. If the USFWS concurs with this finding, consultation under the ESA is complete. If the USFWS disagrees with the finding, additional consultation will occur prior to the Final EA.

4.2.3 National Historic Preservation Act

As described in Section 3.14.1, Reclamation examined records of prior cultural resource investigations to determine if additional surveys were needed to accurately assess impacts under the proposed alternatives. One area was surveyed, and SHPO consultations were completed. On August 21, 2002, the SHPO concurred that sites 35WN49 and WN 50 were “not eligible” for the National Register. SHPO consultations had previously occurred for prior surveys in existing recreational areas where improvements are proposed under the RMP. When implementing the RMP, as required in 36 CFR 800, Reclamation will consult with the SHPO, interested Indian tribes, and other interested parties prior to implementing actions that have the potential to impact historic properties. In letters dated January 15, 2002, Reclamation notified the Siletz Tribe and the Grand Ronde Tribes of the intention to prepare an RMP, and requested that they inform Reclamation if they were aware of cultural resources or other important sites on the reservoir lands. As of this date, Reclamation has received no response from those tribes.

4.3 Tribal Consultation and Coordination

4.3.1 Government-to-Government Consultation with Tribes

The RMP and EA will be distributed to representatives from the Siletz, Warm Springs, and Grand Ronde Tribes. Tribal representatives that will receive the Draft EA are listed in Chapter 7, Distribution List.

4.3.2 Indian Sacred Sites (Executive Order 13007)

Reclamation informed the Siletz and Grand Ronde Tribes about the RMP and requested that they inform Reclamation if they were aware of Indian sacred sites within the study area. The notification and consultation processes were coordinated with the NHPA consultation process. The Tribes have not responded.

4.3.3 Indian Trust Assets

Reclamation coordinated with the Siletz and Grand Ronde Tribes to identify ITAs. These are fully discussed in Chapter 3, Section 3.16, Indian Trust Assets.

4.3.4 Other Laws and Regulations

The relationship between Federal agencies and sovereign Tribes is defined by several laws and regulations addressing the requirement of Federal agencies to notify or consult with Native American

groups or otherwise consider their interests when planning and implementing Federal undertakings. Among these are the following:

- National Environmental Policy Act
- Executive Order 12875, Enhancing the Intergovernmental Partnership
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Presidential Memorandum: Government-to-Government Relations with Native American Tribal Governments
- Executive Order 13084, Consultation and Coordination with Indian Tribal Governments

Reclamation has adhered to these laws and regulations as applicable to the development of the RMP.

5.0 Environmental Commitments

5.0 ENVIRONMENTAL COMMITMENTS

In addition to the BMPs and Mitigation Measures specified below, all actions identified in the Preferred Alternative are also considered to be environmental commitments.

5.1 Best Management Practices

The following best management practices (BMPs) will be implemented to avoid or minimize potential effects to the resources within the Henry Hagg Lake RMP study area that could occur under any alternative.

5.1.1 Landscape Preservation and Impact Avoidance

1. Developed facilities will complement and be subservient with the surrounding landscape wherever possible.
2. Disturbed areas resulting from any construction will be aggressively revegetated.
3. To the maximum extent practicable, all existing trees, shrubs, and other naturally occurring vegetation will be preserved and protected from construction operations and equipment, except where clearing operations are required for permanent structures, approved construction roads, or excavation operations.
4. To the maximum extent practicable, all maintenance yards, field offices, and staging areas will be arranged to preserve trees, shrubs, and other vegetation.
5. Clearing will be restricted to that area needed for construction. In critical habitat areas including, but not limited to, wetlands and riparian areas, clearing may be restricted to only a few feet beyond areas required for construction.
6. To reduce environmental damage, stream corridors, wetlands, riparian areas, steep slopes, or other critical environmental areas will not be used for equipment or materials storage or stockpiling; construction staging or maintenance; field offices; hazardous material or fuel storage, handling, or transfer; or temporary access roads.
7. Excavated or graded materials will not be stockpiled or deposited on or within 100 feet of any steep slopes (defined by industry standards), wetlands, riparian areas, or stream banks (including seasonally active ephemeral streams without woody or herbaceous vegetation growing in the channel bottom), or on native vegetation.
8. To the maximum extent possible, staging areas, access roads, and other site disturbances will be located in disturbed areas, not in native or naturally occurring vegetation.

9. The width of all new permanent access roads will be kept to the absolute minimum needed for safety, avoiding wetland and riparian areas where possible. Turnouts and staging areas will not be placed in wetlands.

5.1.2 Erosion and Sediment Control

1. The design and construction of facilities will employ applicable recognized BMPs to prevent possible soil erosion and subsequent water quality impacts.
2. The planting of grasses, forbs, trees, or shrubs beneficial to wildlife, or the placement of riprap, sand bags, sod, erosion mats, bale dikes, mulch, or excelsior blankets will be used to prevent and minimize erosion and siltation during construction and during the period needed to reestablish permanent vegetative cover on disturbed sites.
3. Final erosion control and site restoration measures will be initiated as soon as a particular area is no longer needed for construction, stockpiling, or access. Clearing schedules will be arranged to minimize exposure of soils.
4. Cuts and fills for relocated and new roads will be sloped to facilitate revegetation.
5. Soil or rock stockpiles, excavated materials, or excess soil materials will not be placed near sensitive habitats, including water channels, wetlands, riparian areas, and on native or naturally occurring vegetation, where they may erode into these habitats or be washed away by high water or storm water runoff. Waste piles will be revegetated using suitable native species after they are shaped to provide a natural appearance.

5.1.3 Biological Resources

1. TES and rare surveys will be conducted as necessary after project authorization, but prior to the start of construction. Any established search protocols will be followed. Additional information concerning avoidance of threatened or endangered species is presented in Sections 3.5 – 3.7.
2. Construction activities that could impact fish will be undertaken during non-spawning periods.
3. During the 10-year period covered by this RMP, species not currently protected under the Endangered Species Act may be listed. If any such species occur on Reclamation lands, Reclamation would enforce time of year access restrictions in areas harboring Federal and State-designated species of special concern (including Federally designated rare, endangered, or threatened species).

5.1.4 Site Restoration and Revegetation

1. Construction areas, including storage yards, will limit the amount of waste material and trash accumulations at all times.
2. All unused materials and trash will be removed from construction and storage sites during the final phase of work. All removed material will be placed in approved sanitary landfills or storage sites, and work areas will be left to conform to the natural landscape.

3. Upon completion of construction, grade any land disturbed outside the limits of reservoir pools, permanent roads, and other permanent facilities to provide proper drainage and blend with the natural contour of the land. Following grading, revegetate using plants native to the area, suitable for the site conditions, and beneficial to wildlife.
4. Where applicable, consult with the following agencies to determine the recommended plant species composition, seeding rates, and planting dates:
 - Oregon Department of Fish and Wildlife
 - U.S. Natural Resources Conservation Service (NRCS)
5. Grasses, forbs, shrubs, and trees appropriate for site conditions and surrounding vegetation will be included on a plant list developed during site design. Species chosen for a site will be matched for site drainage, climate, shading, resistance to erosion, soil type, slope, aspect, and vegetation management goals. Wetland and riparian species will be used in revegetating disturbed wetlands. Upland revegetation shall match the plant list to the site's soil type, topographic position, elevation, and surrounding communities.

5.1.5 Pollution Prevention

1. All Federal and State laws related to control and abatement of water pollution will be complied with. All waste material and sewage from construction activities or project-related features will be disposed of according to Federal and State pollution control regulations.
2. Construction contractors may be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit as established under Public Law 92B500 and amended by the Clean Water Act (Public Law 95B217).
3. Construction specifications shall require construction methods that will prevent entrance or accidental spillage of pollutants into flowing or dry watercourses and underground water sources. Potential pollutants and wastes include refuse, garbage, cement, concrete, sewage effluent, industrial waste, oil and other petroleum products, aggregate processing tailings, mineral salts, drilling mud, and thermal pollution.
4. Eroded materials shall be prevented from entering streams or watercourses during dewatering activities associated with structure foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses.
5. Any construction wastewater discharged into surface waters will be essentially free of settling material. Water pumped from behind cofferdams and wastewater from aggregate processing, concrete batching or other construction operations shall not enter streams or watercourses without water quality treatment. Turbidity control methods may include settling ponds; gravel-filter entrapment dikes; approved flocculating processes not harmful to fish or other aquatic life; recirculation systems for washing aggregates; or other approved methods.

6. Any riprap shall be free of contaminants and not contribute significantly to the turbidity of the reservoir.
7. Appropriate controls to reduce stormwater pollutant loads in post-construction site runoff shall be followed. The appropriate facilities shall be properly designed, installed, and maintained to provide water quality treatment for runoff originating from all recreational facilities.
8. All parking lots and marinas should be designed to promote efficient vehicle and boat traffic to prevent congestion and pollution.
9. Waste facilities should be connected, whenever possible, to sanitary sewer systems instead of septic tanks to avoid water quality problems from failed tanks.

5.1.6 Noise and Air Pollution Prevention

1. Contractors will be required to comply with all applicable Federal, State, and local laws and regulations concerning prevention and control of noise and air pollution. Contractors are expected to use reasonably available methods and devices to control, prevent, and reduce atmospheric emissions or discharges of atmospheric contaminants and noise.
2. Contractors will be required to reduce dust from construction operations and prevent it from damaging dwellings or causing a nuisance to people. Methods such as wetting exposed soil or roads where dust is generated by passing vehicles will be employed.

5.1.7 Cultural Resource Site Protection

1. If Indian Tribes identify culturally important resources within new development areas, avoid adverse impacts to those resource locations when avoidance will allow accomplishment of broader agency responsibilities, is cost effective, and lies within Reclamation's authority.
2. Integrate cultural resource management requirements and goals into other management plans completed under the RMP, including the elk meadows management plan and the Integrated Pest Management Plan.

5.1.8 Miscellaneous Comments

1. Reclamation-issued land use licenses, leases, and permits will contain sufficient language and stipulations to protect existing resources and mitigate possible conflicts among the various users and between visitors and adjacent land owners.

5.2 Mitigation Measures

Mitigation measures are environmental commitments intended to compensate for impacts that cannot be avoided through implementation of BMPs. Mitigation measures have only been identified for water quality and public services and utilities, as identified below.

5.2.1 Water Quality

Any new equestrian trail would have seasonal restrictions to protect soil from excessive erosion and adverse effects to water quality.

5.2.2 Public Services and Utilities

WACO will monitor public use at the park and determine the appropriate level of enforcement and public safety services needed. WACO will provide the appropriate level of service through park personnel or by contracts with local entities.

5.2.3 Cultural Resources

Reclamation will complete research to determine if site 02/801-3 is eligible to the National Register. If eligible, Reclamation will identify and implement actions to either avoid further impacts to the site or to mitigate impacts.

6.0 Preparers

Henry Hagg Lake Resource Management Plan: Draft EA

6.0 PREPARERS

Name	Background	Responsibility
U.S. Bureau of Reclamation		
Carolyn Burpee-Stone	Landscape Architect	Senior Review, RMP Manager
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Lynne MacDonald	Archeologist	Cultural Resources and Indian Sacred Sites
EDAW, Inc.		
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Kevin Butterbaugh	Environmental Planner	Senior Review, RMP Project Manager and Principal Planner
Christy Carr	Recreation Planner	Recreation
Rob Harris	GIS Specialist	Mapping
Kirk Prindle	Terrestrial Ecologist	Fish and Wildlife, Threatened and Endangered Species
Jeff Bouma	Land Use Planner	Noise, Visual Resources, Land Use, Socioeconomics, Public Services and Utilities, and Transportation
Peter Carr	Technical Writer	Technical Writing, Editing
Liza MacKinnon	Production Manager	Document Production

7.0 Distribution List

7.0 DISTRIBUTION LIST

7.1 Overview

The Henry Hagg RMP Draft EA is a document intended for public review and comment. Therefore, it has been sent to the Tribes, government officials, agencies, organizations and businesses, news media, libraries, and individuals named in the following distribution list. As noted, the Draft EA is available for review at several libraries; it is also available for viewing (and downloading, if desired) on Reclamation's web site. In addition, a third Newsbrief was sent out in May which included a clip-out request order form allowing the more than 400 individuals already on the Henry Hagg RMP Draft EA mailing list to request a copy of the document (in either hard copy or digital format).

7.2 Tribes

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Ron Wyden Hon. US Senate
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7.4 Agencies

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Washington County
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7.5 Organizations and Businesses

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Fernhill Wetlands Council
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Friends of Fernhill Wetlands
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Friends of Gales Creek
Nancy Spieler
3530 16th Place
Forest Grove, OR 97116-2105

Friends of Jackson Bottom
Faun Hosey
PO Box 114
Hillsboro, OR 97123

Longview Fibre Co.
Timber Dept
PO Box 639
Longview, WA 98632

Mazamas
James Olson
18107 SW Sandra Lane
Beaverton, OR 97006

Northwest Outdoor Science School
Gary Myers, Director
5825 NE Ray Circle
Hillsboro, OR 97124

Northwest Steelheaders Association
6641 SE Lake Road
Milwaukee, OR 97034

Oregon Bass & Panfish Club
Herb Doumitt, President
22520 NW Dogwood Street
Hillsboro, OR 97124

Oregon Environmental Council
520 SW 6th Ave Suite 940
Portland, OR 97204

Oregon Equestrian Trails, Inc.
Ray Wold
18500 NW Keller Road
North Plains, OR 97133

Oregon Natural Resources Council
5852 N Greeley Ave
Portland, OR 97214

Oregon Road Runners Club
Scott Diamond
6620 SW Hyland Way
Beaverton, OR 97008

Oregon Trout
Geoff Pampush
117 SW Front Ave
Portland, OR 97204

Oregon Wildlife Federation
PO Box 5878
Portland, OR 97228
Pacific Rivers Council
PO Box 10798
Eugene, OR 97228

Pump Cyclists
Ric Balfour
2415 14th Avenue
Forest Grove, OR 97116

Scott Land & Timber Co Inc.
PO Box 810
Forest Grove, OR 97116

Sierra Club
2950 SE Stark
Portland, OR 97214-3082

Stimson Lumber Company
John McGhehey, Vice Pres
PO Box 68
Forest Grove, OR 971160

Tigard Tualatin District
Maryalice Russell
6960 SW Sandburg St
Tigard, OR 97223-8039

Trout Unlimited - Oregon Council
Tom Wolf
22875 NW Chestnut Street
Hillsboro, OR 97124

Tualatin Riverkeepers
Sue Marshall
16340 SW Beef Bend Road
Sherwood, OR 97219

Tualatin Valley Irrigation District

Wally Otto, Resv. Supt.
2330 Elm Street
Forest Grove, OR 97116

Water Resources Congress
Jan Lee
1201 Court St NE, Suite 303
Salem, OR 97301

Waterwatch of Oregon
Reed Benson/Kelly Webb,
213 SW Ash, Suite 208
Portland, OR 97204

7.6 News Media

Forest Grove News-Times
PO Box 408
Forest Grove, OR 97116-0408

Hillsboro Argus Newspaper
PO Box 588
Hillsboro, OR 97123

Portland Observer
PO Box 566
Hillsboro, OR 97123-0566

The Oregonian
1320 SW Broadway
Portland, OR 97201

7.7 Libraries

Forest Grove Public Library
2114 Pacific Avenue
Forest Grove, OR 97116

Hillsboro Public Library
775 SE 10th Street
Hillsboro, OR 97123

Hillsboro Public Library
2453 NW 185th Avenue
Hillsboro, OR 97124

Multnomah Central Library
801 SW 10th
Portland, OR 97205

Portland State University
Portland State Library
724 Harrison Street
Portland, OR 97201

7.8 Individuals

George & Ruth Dallas
54079 SW Scoggins Valley Rd
Gaston, OR 97119

Julie Pruitt
928 SW Stepien Road
Gaston, OR 97119

8.0 Glossary

8.0 GLOSSARY

Acre-foot	Volume of water (43,560 cubic feet) that would cover 1 acre land, 1 foot deep.
Action Alternative	A change in the current management approach.
Affected environment	Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action. Also, the chapter in an environmental document describing current environmental conditions.
Alternatives	Courses of action that may meet the objectives of a proposal at varying levels of accomplishment, including the most likely future conditions without the management plan or action.
Amphibian	Vertebrate animal that has a life stage in water and a life stage on land (for example, salamanders, frogs, and toads).
Aquatic	Living or growing in or on the water.
Archeology	Related to the study of human cultures through the recovery and analysis of their material relics.
Archeological site	A discrete location that provides physical evidence of past human use.
Best Management Practices	Activities that are added to typical operation, construction, or maintenance efforts that help to protect environmental resources by avoiding or minimizing impacts of an action.
Community	A group of one or more interacting populations of plants and animals in a common spatial arrangement at a particular point in time.
Concentration	The density or amount of a substance in a solution (water quality).
Cubic foot per second (cfs)	As a rate of streamflow, a cubic foot of water passing a reference section in 1 second of time. A measure of a moving volume of water.
Cultural resource	Cultural resources are historic and traditional properties that reflect our heritage.
Drawdown	Lowering of a reservoir's water level; process of releasing reservoir storage.

Endangered species	A species or subspecies whose survival is in danger of extinction throughout all or a significant portion of its range.
Erosion	Refers to soil and the wearing away of the land surface by water, wind, ice, or other physical processes.
Exotic species	A non-native species that is introduced into an area.
Facilities	Manmade structures.
Fish and Wildlife Service Species of Concern	Species identified by the FWS for which further biological research and field study are needed to resolve these species' conservation status.
Habitat	Area where a plant or animal finds suitable living conditions.
Indian Sacred Sites	Defined in Executive Order 13007 as “any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.”
Indian Trust Assets	Legal interests in property held in trust by the United States for Indian Tribes or individuals, such as lands, minerals, hunting and fishing rights, and water rights.
Juvenile	Young animal that has not reached reproductive age.
Mitigation measures	Action taken to avoid, reduce the severity of, or eliminate an adverse impact. Mitigation can include one or more of the following: (1) avoiding impacts; (2) minimizing impacts by limiting the degree or magnitude of an action; (3) rectifying impacts by restoration, rehabilitation, or repair of the affected environment; (4) reducing or eliminating impacts over time; and (5) compensating for the impact by replacing or providing substitute resources or environments to offset the loss.
National Register of Historic Places	A Federally maintained register of districts, sites, buildings, structures, and properties that meet the criteria of significance defined in 36 CFR 63.
No Action Alternative	The outcome expected from a continuation of current management practices.

Perennial	Plants that have a life cycle that lasts for more than 2 years.
Precipitation	Rain, sleet, and snow.
Public involvement	The systematic provision for affected publics to be informed about and participate in Reclamation decision making. It centers around effective, open exchange and communication among the partners, agencies, organizations, and all the various affected publics.
Raptor	Any predatory bird, such as a falcon, eagle, hawk, or owl, that has feet with sharp talons or claws and a hooked beak.
Reptile	Cold-blooded vertebrate of the class Reptilia, comprised of turtles, snakes, lizards, and crocodiles.
Resident	A wildlife species commonly found in an area during a particular season: summer, winter, or year round.
Resource topics	The components of the natural and human environment that could be affected by the alternatives, such as water quality, wildlife, socioeconomic, and cultural resources.
Resource Management Plan	A 10-year plan developed by Reclamation to manage their lands and resources in the study area.
Riparian	Of, on, or pertaining to the bank of a river, pond, or lake.
Runoff	That part of precipitation that contributes to streamflow, groundwater, lakes, or reservoir storage.
Sediment	Unconsolidated solid material that comes from weathering of rock and is carried by, suspended in, or deposited by water or wind.
Songbird	Small to medium-sized birds that perch and vocalize or "sing," primarily during the breeding season.
Spawning	Laying eggs directly in water, especially in reference to fish.
Species	In taxonomy, a subdivision of a genus that (1) has a high degree of similarity, (2) is capable of interbreeding only within the species, and (3) shows persistent differences from members of allied species.
Threatened species	Any species that has the potential of becoming endangered in the near future and is listed as a threatened species under the Endangered Species Act.

Traditional Cultural Property	A site or resource that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community.
Wetland habitat	Wildlife habitat associated with water less than 6 feet deep, with or without emergent and aquatic vegetation in wetlands.
Wetlands	Lands transitional between aquatic and terrestrial systems where the water table is usually at or near the land surface or the land is covered by shallow water. Often called marshes or wet meadows.

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9.0 BIBLIOGRAPHY

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Appendix A

Henry Hagg Lake RMP Goals and Objectives

Henry Hagg Lake Resource Management Plan: Draft EA

HENRY HAGG LAKE RESOURCE MANAGEMENT PLAN DRAFT GOALS AND OBJECTIVES

Introduction

This set of draft RMP Goals and Objectives is being prepared as part of the RMP alternatives development and analysis process. The draft Goals and Objectives were derived from: (1) the public involvement process (especially Ad Hoc Work Group discussions and clarification related to pertinent issues outlined in the Problem Statement); (2) ongoing coordination with Reclamation decision-makers regarding the scope of the RMP and Reclamation's mission/authority related to RMP preparation and implementation; (3) findings of the RMP resource inventory; and (4) input from specialists on the RMP Planning Team. These draft Goals and Objectives are intended to communicate the current direction of the RMP in terms of management philosophy, RMP requirements and approach, and potential areas for management action; they reflect the full range of issues and opportunities which must be addressed in the RMP (as presented and discussed in the separate Problem Statement document).

In many cases (i.e., where the broad direction of the RMP is clear and not subject to dispute or analysis of alternative approaches), the draft Goals and Objectives contained herein are expected to remain in their present form as part of the final RMP. This is particularly true of the goal statements and most objectives that are not facility specific. These Goals and Objectives will serve as a framework for development and analysis of the more detailed alternative plans. They will be used as criteria by which the acceptability and success of alternative courses of action will be assessed.

In some cases, however, the objectives presented in this document are truly interim and may change as a result of the RMP alternatives analysis process. Basically, the objectives are intended to guide the development of RMP alternatives. Therefore, this document should be used as an interactive part of the RMP alternatives development and analysis process and will be modified through that process. For example, one of the recreation-oriented objectives is specifically geared towards developing and maintaining an equestrian trail. This objective applies to only one of the alternatives (which are being prepared in concert with these goals and objectives); therefore, if it is determined through the planning process that it should not be part of the final plan then it will be dropped as an objective in the RMP. In this regard, the objectives that apply to only one of the alternatives (and have the potential to be dropped) are noted in this document with a “**” at the beginning of the objective.

The RMP will also be governed by a number of legal mandates, all of which will serve as guidance in both interpreting the Goals and Objectives and implementing proposed management actions. The primary among these are listed below:

Law, Executive Order, or Policy	Description
American Indian Religious Freedom Act of 1978	Provides for freedom of Native Americans to believe, express, and exercise their traditional religion, including access to important sites.
Archaeological Resources Protection Act (ARPA) of 1979, as amended	Ensures the protection and preservation of archaeological sites on Federal land. ARPA requires that Federal permits be obtained before cultural resource investigations begin on Federal land. It also requires that investigators consult with the appropriate Native American groups before conducting archaeological studies on Native American origin sites.
Archeological and Historic Preservation Act of 1974	Provides for the preservation of historical buildings, sites, and objects of national significance.
Clean Water Act (CWA) of 1974, as amended*	Provides for protection of water quality.
Clean Air Act (CAA) of 1970	Provides for protection of air quality.
Endangered Species Act (ESA) of 1973, as amended	Provides for protection of plants, fish, and wildlife that have a designation as threatened or endangered.
Executive Order 12898, February 11, 1994, Environmental Justice, as amended by Executive Order 12948, January 30, 1995.	Requires Federal agencies to consider the effects of its programs and policies on minority and lower income populations.
Executive Order 11990, Protection of Wetlands	Directs all Federal agencies to avoid, if possible, adverse impacts to wetlands and to preserve and enhance the natural and beneficial values of wetlands.
Executive Order 13007, Indian Sacred Sites, May 24, 1996	Provides for access to, and ceremonial use of, Indian sacred sites on Federal lands used by Indian religious practitioners.
Executive Order 13175, Consultation and Coordination with Indian Tribal Government, November 6, 2000 (revokes EO 13084)	<p>The EO builds on previous administrative actions and is intended to:</p> <ul style="list-style-type: none"> • Establish regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications. • Strengthen government- to-government relations with Indian tribes; and • Reduce the imposition of unfunded mandates upon Indian tribes.
Fish and Wildlife Coordination Act (FWCA) of 1958	Requires consultation and coordination with the U.S. Fish and Wildlife Service

Law, Executive Order, or Policy	Description
Indian Trust Assets Policy (July 1993)	Reclamation will carry out its activities in a manner which protects Indian Trust Assets and avoids adverse impacts when possible.
Migratory Bird Treaty Act of 1918, as amended	Provides protection for bird species that migrate across state lines.
Executive Order 13186, January 10, 2001. Responsibilities of Federal Agencies to Protect Migratory Birds	Requires Federal Agencies that may have a negative effect on migratory birds to develop and implement a Memorandum of Understanding with the U.S. Fish and Wildlife Service to promote the conservation of migratory birds.
National Environmental Policy Act (NEPA) of 1969	Council on Environmental Quality regulations implementing NEPA specify that as part of the NEPA scoping process, the lead agency "... shall invite the participation of affected Federal, State, and local agencies, any affected Indian tribe, ... (1501.7[a]1."
National Historic Preservation Act (NHPA) of 1966, as amended	Section 106 of the NHPA requires Federal agencies to consider the effects of any actions or programs on historic properties. It also requires agencies to consult with Native American Tribes if a proposed Federal action may affect properties to which they attach religious and cultural significance. Section 110 requires agencies to identify and appropriately manage historic properties on lands under their jurisdiction.
Native American Graves Protection and Repatriation Act (NAGPRA) of 1990	Regulations for Tribal consultation in the event of discovery of Native American graves. Requires consultation with Tribes during Federal project planning if graves might be discovered.
Presidential Memorandum: Government-to-Government Relations with Native American Tribal Governments, April 29, 1994	Specifies a commitment to developing more effective day-to-day working relationships with sovereign Tribal governments. Each executive department and agency shall consult to the greatest extent practicable and to the extent permitted by law, with Tribal governments prior to taking actions affecting Federally recognized Tribal governments.
Accessibility for Persons with Disabilities – Reclamation Policy (November 18, 1998)	Established a Pacific Northwest regional policy to assure that all administrative offices, facilities, services, and programs open to the public, utilized by Federal employees, and managed by Reclamation, a managing partner, or a concessionaire, are fully accessible for both employees and the public.

Law, Executive Order, or Policy	Description
Reclamation Policy for Land Management & Concessions	Provides policy, directives, and standards Reclamation follows in managing Federal Project lands, facilities, and concessions.
Rehabilitation Act of 1973, Title V, Section 504	Provides for access to Federal or Federally assisted facilities for the disabled. The Uniform Federal Accessibility Standards (UFAS) or the Americans with Disabilities Act Accessibility Guidelines (ADAAG), whichever is the more stringent, are followed as compliance with Section 504.
Public Law 102-575, Title 28, as amended	Provides Reclamation with the authority to cost-share on recreation projects and fish and wildlife enhancement facilities with public non-Federal managing partners on Reclamation lands and authorization for preparing RMPs.
Interior Department Manual Part 512, Chapter 2	Articulates the policies, responsibilities and procedures for consulting with tribes to identify and assess impacts to Indian trust resources.

*A permit may need to be required for construction related activities.

RMP Policy and Purpose

Reclamation's resource management policy is to provide a broad level of stewardship to ensure and encourage resource protection, conservation, and multiple use, as appropriate. Management practices and principles established in an RMP must be consistent with Project purposes and in accordance with existing Federal laws, regulations, and policies, and provide for the protection of fish, wildlife, and other natural resources; cultural resources; public health and safety; and applicable uses of Reclamation lands and water areas, public access, and outdoor recreation. Resource Management Plans are intended to be used as the basis for directing activities on Reclamation lands and reservoirs in a way that maximizes overall public and resource benefits while providing guidance for managing the area during the next 10 year period. Through implementation of an RMP, Reclamation aims to balance competing and conflicting demands for differing uses and to maximize compatibility with surrounding land uses, while affording an appropriate level of resource protection and enhancement.

Draft Goals & Objectives

As stated and shown in the above table the RMP will be governed by a number of legal mandates, all of which will serve as guidance in both interpreting the goals and objectives and implementing proposed management actions. In all cases, implementation of the draft goals and objectives listed below, and any specific management actions resulting from them, will comply with the applicable legal mandates in the above table.

Natural Resources (NAT)

Wildlife and Vegetation Management

GOAL NAT 1: *Protect, conserve, and enhance wildlife habitat and natural resources on Reclamation lands.*

Objective NAT 1.1: Avoid or minimize impacts of RMP actions on Federal and State designated species of special concern, including Federally listed rare, endangered, or threatened species.

Objective NAT 1.2: Minimize adverse impacts to wildlife and vegetation in all actions considered to accommodate public demand at recreation sites or on the surface and shoreline of Henry Hagg Lake; and utilize management practices that protect and enhance resource values of and for native species (plants and animals) in all decisions related to habitat management and land use.

Objective NAT 1.3: Protect and/or enhance wetland and riparian habitats at and adjacent to Henry Hagg Lake in accordance with existing Federal regulations and consistent with this RMP.

Objective NAT 1.4: Work with partner agencies to study and effectively control aquatic and terrestrial noxious and invasive weeds on Reclamation lands and waters, including invasive aquatic species such as zebra mussels (and other mollusks).

Objective NAT 1.5: Manage lands designated as elk meadows for the primary purpose of providing forage areas for elk; other uses of these areas should be considered secondary in importance and allowed only if shown to not pose any disturbance to elk.

****Objective NAT 1.6:** Manage lands located between developed recreation sites as land use buffer zones to protect habitat for waterfowl, other migratory birds, and upland wildlife.

Fishery Resources

GOAL NAT 2: *Protect and enhance the quality of the fishery at Henry Hagg Lake.*

Objective NAT 2.1: Recommend reservoir levels be maintained in a manner that is most beneficial to reservoir fishery resource protection within the constraints of legal and contractual operations requirements.

Objective NAT 2.2: Continue to cooperate with ODFW in ongoing monitoring of reservoir fishery conditions and improvements, as needed.

Water Quality

GOAL NAT 3: *Protect and improve water quality in Henry Hagg Lake and its tributaries.*

Objective NAT 3.1: Provide adequate sanitation and waste management facilities at all recreation sites (e.g., restrooms, floating restrooms, trash containers, RV and boat dump stations, fish cleaning stations, as appropriate) to protect water quality.

Objective NAT 3.2: Protect, enhance, restore, and develop wetland and riparian habitats as a key means of improving the quality of water entering the reservoir.

Objective NAT 3.3: Continue to prohibit motorized vehicular use on the shoreline (outside of designated recreation sites or access ways) and within the drawdown area of the reservoir.

Objective NAT 3.4: Manage the use of chemical fertilizers, herbicides, and pesticides on Reclamation lands in a manner that does not adversely affect water quality.

Objective NAT 3.5: Minimize the potential for pollutants to enter Henry Hagg Lake and its tributaries from activities on Reclamation lands.

Erosion and Sedimentation

GOAL NAT 4: Control soil erosion in priority areas where erosion causes concern for water quality, safety, and damage to resources and facilities.

Objective NAT 4.1: Enforce restrictions on recreational and other uses in shoreline areas where such uses can significantly increase erosion and cannot be mitigated.

Objective NAT 4.2: Protect and/or restore shoreline vegetation and tributary riparian vegetation to control erosion.

Objective NAT 4.3: Cooperate with applicable agencies and affected private landowners to work on getting BMPs instituted on surrounding lands where offsite activities may affect Reclamation lands and Henry Hagg Lake.

Objective NAT 4.4: Implement an effective erosion control program (standards, guidelines, and BMPs) in all construction, operations, and maintenance programs on Reclamation lands while considering program effects on other resources (natural, scenic, cultural).

Cultural Resources (CUL)

Goal CUL 1: Seek to protect and preserve cultural resources, including prehistoric and historic-period archaeological sites and traditional cultural properties.

Objective CUL 1.1: In accordance with Section 106 of the National Historic Preservation Act (NHPA) seek to protect National Register-eligible sites from impacts from new undertakings.

Objective CUL 1.2: In accordance with Section 110 of the NHPA implement proactive management of cultural resources, focusing on protecting identified resources from damage.

Objective CUL 1.3: Increase awareness of cultural resources compliance and protection requirements among resource management partners.

Objective CUL 1.4: With local partners provide opportunities for public education on area prehistory and history, including the importance of and requirements for protecting these resources.

Indian Sacred Sites (ISS)

Goal ISS 1: *Comply with requirements of Executive Order 13007 (Indian Sacred Sites)*

Objective ISS 1.1 Seek to avoid damage to Indian sacred sites (when present and identified), when avoidance is consistent with accomplishing Reclamation's mission and larger public responsibilities.

Objective ISS 1.2 Provide for access by traditional religious practitioners to sacred sites, when consistent with mission.

Indian Trust Assets (ITA)

Goal ITA 1: *Protect and conserve Indian Trust Assets as specified in applicable Federal mandates.*

Objective ITA 1.1: Seek to avoid any action that would adversely impact Indian Trust Assets as defined in tribal treaties or court decisions.

Recreation and Access (REC)

Land-based Recreation

GOAL REC 1: *Provide adequate sites and facilities for land-based recreational uses while affording the public a quality recreational experience, consistent with natural and cultural resource objectives.*

Objective REC 1.1: In all recreation facility development, focus first on expansion and capacity optimization at existing sites before developing any new sites.

Objective REC 1.2: Coordinate with managing partner (WACO) to provide additional day use sites and facilities in an effort to meet increasing demand in a manner reflecting the physical constraints and safe use of the area being served.

Objective REC 1.3: Coordinate with managing partner (WACO) to assure special events are scheduled and carried out to avoid resource degradation and minimize conflicts with other park users.

Objective REC 1.4: Coordinate with managing partner (WACO) to reduce and/or eliminate the environmental degradation that accompanies unauthorized activities (e.g., littering, off-leash dogs) in accordance with County Code (11.08).

Objective REC 1.5: Contribute to an environment that supports viable concession services, where appropriate; with concession management to follow Reclamation's policy.

Objective REC 1.6: Provide opportunities for wildlife observation and other natural resource based interpretation and education at appropriate locations.

****Objective REC 1.7:** Coordinate with managing partner (WACO) to provide a full range of camping experiences (i.e., RVs, tent-only, and group camping) by reopening Recreation Area "A" East to accommodate camping (also see LMI 3.2 and 3.4).

Shoreline and Water-based Recreation

GOAL REC 2: Provide adequate shoreline and water-based facilities to support the demand for boating and other water-based uses consistent with natural and cultural resource objectives.

Objective REC 2.1: Coordinate with managing partner (WACO) to enhance and provide safe shoreline fishing opportunities and associated parking at Henry Hagg Lake.

Objective REC 2.2: Coordinate with managing partner (WACO) to improve boat launch ramps and associated infrastructure at Henry Hagg Lake consistent with natural and cultural resource protection and conservation objectives.

Objective REC 2.3: Coordinate with managing partner (WACO) to manage peak period use at Recreation Area "A" West boat launch.

****Objective REC 2.4:** Coordinate with managing partner (WACO) to provide an exclusive launch area for non-motorized and portable watercraft at the Cove Area adjacent to Recreation Area "C".

Water Surface Management

GOAL REC 3: Manage the Henry Hagg Lake water surface to accommodate a variety of uses in a safe manner while minimizing conflicts among users.

Objective REC 3.1: Ensure that provision, permitting, and/or expansion of shoreline facilities does not result in providing levels of water access that exceed safe use of the reservoir's water surface.

Objective REC 3.2: Coordinate with managing partner (WACO) and County Sheriff to adequately enforce no-wake boating regulations within the area of the reservoir designated for such use.

Objective REC 3.3: Coordinate with managing partner (WACO), County Sheriff, and Coast Guard Auxiliary to provide information to reservoir users regarding boating safety and operating rules and regulations.

Access

GOAL REC 4: Provide appropriate vehicular and non-motorized access to recreation sites at Henry Hagg Lake consistent with natural, cultural resource, and safety and security objectives.

Objective REC 4.1: Coordinate with WACO to provide for adequate vehicular access to and parking at all designated recreation areas at Henry Hagg Lake; this includes appropriate motor vehicle parking and staging areas adjacent to or near sites designated for non-motorized uses. Such access and parking should be sized in a manner reflecting the physical constraints and safe use of the area being served.

Objective REC 4.2: Coordinate with managing partner (WACO) and County road department to widen road shoulders adjacent to designated recreation areas to accommodate parking outside of the bike lane, where possible.

Objective REC 4.3: Coordinate with WACO to provide for and maintain non-motorized trail opportunities (hiking and bicycling) at Henry Hagg Lake.

Objective REC 4.4: All new or existing facilities and programs will be designed or retrofitted in accordance with current Federal standards for accessibility to persons with disabilities.

Objective REC 4.5: Continue Reclamation policy of prohibiting ORV use on Reclamation lands and work with managing partner (WACO) to actively enforce this regulation.

Objective REC 4.6: Coordinate with managing partner (WACO), County Sheriff's Department, and County road department to implement an "adopt-a-highway" program for trash pick-up along the park road to augment the current County Sheriff's community corrections program dealing with clean-ups along the park road.

****Objective REC 4.7:** Coordinate with managing partner (WACO) to completely separate the Master (shoreline) Trail from its current segments along the County road.

****Objective REC 4.8:** Coordinate with managing partner (WACO) and equestrian groups to provide for and maintain equestrian trails (separate from hiking and bicycling trails) and trail heads at Henry Hagg Lake.

****Objective REC 4.9:** Coordinate with managing partner (WACO) and the County Department of Land Use and Transportation, if feasible and justified due to security concerns and carrying capacity limitations, to implement a limited access concept plan whereby park

traffic is required to access the area through the fee station and local traffic is afforded a separate, gated access.

Land Use, Management, and Implementation (LMI)

GOAL LMI 1: Allow for expanded recreation opportunities and other uses while balancing the need for the preservation of natural and cultural resources, and open space and scenic values.

Objective LMI 1.1: Ensure that siting and design of all new facilities on Reclamation lands maximize compatibility and integration with the open, rural environment of the reservoir and surrounding area.

Objective LMI 1.2: Require compliance with applicable design standards, guidelines, and BMPs for erosion control structures and any other permitted improvements along the shoreline of Reclamation lands (also see Objective NAT 4.4).

****Objective LMI 1.3:** Coordinate with the Northwest Regional Education Service District, Portland State University, WACO, and other pertinent entities to authorize development of the Tualatin Watershed Education & Research Center.

****Objective LMI 1.4:** Coordinate with the Northwest Regional Education Center Service District and Portland State University to ensure that the Tualatin Watershed Education & Research Center meets the requirement to replace the existing elk pasture meadow in an approved location on Reclamation-controlled lands, existing or future.

****Objective LMI 1.5:** Coordinate with the Northwest Regional Education Service District and Portland State University to ensure that the Tualatin Watershed Education & Research Center includes a reasonable location and times for local community events/programs.

GOAL LMI 2: Ensure that reservoir operations are not disturbed as a result of other uses and activities.

Objective LMI 2.1: Require that the Reclamation Zone (operation and maintenance) be described (history, purpose, function) and shown on publicly distributed materials.

Objective LMI 2.2: Safety and security of the dam and area surrounding the dam has priority over public access to this area; if deemed necessary for safety and security reasons this area will be closed to public access.

GOAL LMI 3: Ensure protection of the public, and public resource values and facilities.

Objective LMI 3.1: Require that Reclamation's directives and standards as pertaining to the Federal Wildland Fire Management Policy be followed in all fire prevention and suppression activities on Reclamation lands.

Objective LMI 3.2: Allow for current emergency service agreements to continue and be expanded or modified as needed---Oregon Department of Forestry for fire suppression along the northern portion of Reclamation lands, and Gaston Rural Fire Department for fire suppression along the southern portion of Reclamation lands and medical emergencies within the entire Scoggins Valley Park.

Objective LMI 3.3: Cooperate with other interested agencies and parties to improve emergency communications ability at Henry Hagg Lake.

Objective LMI 3.4: Work with managing partner (WACO), County Sheriff's Department, and the Oregon State Marine Board to ensure an adequate level of law enforcement on Reclamation lands and Henry Hagg Lake.

GOAL LMI 4: Provide informational, educational, and interpretive materials to increase public awareness of recreational opportunities, use restrictions, safety concerns, and natural and cultural resource values.

Objective LMI 4.1: Using Reclamation's and Washington County's sign manuals as appropriate, develop clear, consistent signage to guide public access to and use of Reclamation lands and park facilities.

Objective LMI 4.2: Provide informative and concise public information materials on a continuing basis (including adequate funding for reproduction of these materials) at: fee station, recreation areas, roadside pullouts; and through local merchants, chambers of commerce, government offices, and other means (such as the World Wide Web).

Objective LMI 4.3: Develop an interpretive program that illustrates the prehistoric, historic, and current land use practices, as well as natural features surrounding and visible from Henry Hagg Lake (e.g., tribal use of the area, agricultural use of the valley, forestry practices, geology, etc.).

GOAL LMI 5: Achieve timely implementation of RMP programs and projects.

Objective LMI 5.1: Establish and maintain a clear phasing schedule and list of priorities for RMP implementation; and update on an annual basis.

Objective LMI 5.2: Seek Reclamation and managing partner (WACO) joint funding to implement RMP recreation development and fish and wildlife enhancement efforts according to the priority list and phasing schedule.

Objective LMI 5.3: Keep stakeholders, surrounding landowners, and the public informed regarding the status of implementing the RMP.

Appendix B

Elk Meadow Management Plan

Henry Hagg Lake Resource Management Plan: Draft EA

Elk Mitigation Meadows Maintenance and Monitoring Plan

Henry Hagg Lake, Tualatin Project, Oregon

1.0 Introduction

When Scoggins Dam was constructed, the flooding of the valley (in 1978) that created Henry Hagg Lake, inundated habitat used by elk (*Cervus elaphus roosevelti*) for foraging primarily in the winter. Managed elk pastures are a required component of the Tualatin Project to mitigate for the loss of valley floor meadow habitat. The Bureau of Reclamation (Reclamation) has been working cooperatively with both Oregon Department of Fish and Wildlife (ODFW) and the U.S. Fish and Wildlife Service (USFWS) on the most reasonable and appropriate measures to be implemented at Hagg Lake to ensure the continuation of healthy elk herds in the Scoggins Creek subbasin. The goals of this management plan are to 1) provide approximately 140 acres of high quality forage for wintering elk around Henry Hagg Lake, 2) provide a method of accurately and effectively monitoring elk use of these pastures, and 3) to provide a framework for reporting results of the monitoring effort and coordinating with ODFW and USFWS.

Reclamation researched the history of elk winter range mitigation at Hagg Lake through archived documents. The oldest record that discusses mitigation for the loss of elk winter habitat is the “Supplement to the Final Environmental Statement on Tualatin Project, Oregon” (Supplement) dated December 6, 1973. In this document, Reclamation recognizes that elk winter range would be eliminated in areas inundated by Scoggins Dam. The affected elk population was estimated to be approximately 100 individuals. The Supplement also calls attention to a compensation plan being developed by the Oregon Game Commission (renamed ODFW) in consultation with USFWS and Reclamation. Subsequently a letter was sent from the Director of the Oregon Game Commission to Reclamation’s Regional Director transmitting the “Wildlife Compensation Plan for the Scoggins Reservoir Project” on April 24, 1974. This Plan included nine units around the reservoir that were potential sites to improve elk habitat including a map of their locations and site descriptions. This Plan noted that flexibility in site locations was prudent for both biological and recreational concerns. Reclamation located five other documents in its records search from 1977 through 1992 in which discussion of elk habitat mitigation would be relevant but the subject was given little attention. The issue was brought back to the forefront in 1994 in the “Scoggins Valley/Henry Hagg Lake Recreation Development Finding of No Significant Impact (FONSI) and Environmental Assessment (EA).” The 1994 EA referenced the 1974 Wildlife Compensation Plan and included a map of elk meadow locations based on the 1974 Plan.

Historically elk were abundant throughout Oregon before non-native settlers arrived, according to early accounts by pioneers. Elk were nearly extirpated from Oregon by the late 1890’s due to unfettered hunting by settlers who hunted elk as a primary source of meat. Remnant elk populations became clustered into the Coast Range, the Cascades, and the Willamette Mountains. Elk hunting was abolished in Oregon from 1900 – 1904 and from 1909 – 1932. Throughout the 20th century numerous different strategies for regulating the increasing elk population were initiated by ODFW including manipulations

to the length and timing of hunting seasons, restricting the bag limit, age, and/or sex of animals harvested (ODFW 2002).

ODFW manages elk herds in Oregon to maximize public recreational opportunities within the constraints of habitat capacity and primary land uses. It is also ODFW's responsibility to respond to damage complaints and to minimize elk damage through its policies and regulations.

Elk migrate annually from summer habitat at higher elevations in October through November to lower elevations in the winter. Elk migrate back to higher elevations in March through April. Seasonal movements are in response to vegetation availability and snow cover. In the mild climate of the Coast Range, elk migrate shorter distances between summer and winter ranges (Verts and Caraway 1998). On the west slope of the Cascade Range, for example, migration is less than 64 km and winter ranges are less than 1,100 hectares (Verts and Caraway 1998). Elk in the Coast Range would likely have smaller winter ranges and migrate shorter distances.

To achieve and maintain peak health conditions elk need access to food resources in sufficient abundance to support their needs for winter survival, reproduction, calf survival, and male antler growth (ODFW 2002). Before the construction of Scoggins Dam, landscape level disturbances such as fires and floods set back the process of natural succession in meadow habitat. Human intervention has nearly eliminated these processes and the encroachment of surrounding vegetation, especially unpalatable species, has reduced the value of winter pasture habitat for elk over time (Scotter 1980). All of the elk winter pasture areas at Henry Hagg Lake will require preparation and maintenance to provide high quality winter forage.

2.0 Elk Meadow Rehabilitation and Maintenance Plan

The following narrative provides a description of the components of elk meadow maintenance including meadow rehabilitation, a rehabilitation and maintenance schedule, and buffer establishment. Currently there are approximately 110 acres designated as elk meadow at Henry Hagg Lake. Under this plan elk meadows 6a and 6b would be new meadows that have had no previous meadow rehabilitation. These sites currently are thickly vegetated with non-native, unpalatable species. Meadows 3 and 4 have had ongoing meadow management, however they were not previously defined as elk mitigation meadows in the 1974 Wildlife Compensation Plan or the 1994 EA. Table 2-1 below lists the size of each meadow in acres. Figure 2-1 shows the location of existing and planned elk meadows at Henry Hagg Reservoir.

Table 2-1. Acres of elk pasture at Hagg Lake

Elk Meadow	1	2a	2b	2c	3	4	5a	5b	6a	6b	Total
Acres	19.8	6.0	3.5	6.4	15.2	23.4	6.4	29.5	27.5	1.7	139.4

2.1 Meadow Rehabilitation

For meadows 6a and 6b the first step in rehabilitation would be the removal of Scot's broom (*Cytisus scoparius*), Himalayan blackberry (*Rubrus discolor*), and other woody species that occupy the site. Following this initial step of removing woody vegetation, treatment would be the same among the meadows. The standard practice for pasture development is to spray the existing vegetation with some type of herbicide, plow the field, disc the field, pack ground with rollers, drill seed, and pack ground with rollers again.

The choice of a seed mix should maximize good forage plant species for elk in a grass/clover ratio that has proved attractive to elk at other locations. ODFW's Jewell Meadows Wildlife Area has extensive experience with elk pasture preparation and maintenance and is similar enough to Scoggins Valley in climate conditions that the same seed mix would likely be the best choice at Hagg Lake. ODFW uses a custom seed mix that is 65% grass and 35% clover, meets or exceeds the standards for Oregon certified seed, contains no noxious weeds, is legume inoculated, and is at least 98% pure seed. An example of a seed mix that works well for ODFW is 26% annual rye grass (tetraploid variety), 25% orchard grass, 17% New Zealand white clover, 15% perennial rye grass, 7% birdsfoot trefoil, 6% red clover, and 4% alsike clover (Bryan Swearingen, ODFW Jewell Refuge, January 9, 2003 pers. comm.). An alternative to the above seed mixture would be a beef cattle pasture seed mix that is 65% grass and 35% clover with the same or better seed standards. These are not native grasses and legumes, but they are used ubiquitously in Oregon for livestock pasture and are not invasive or noxious. In addition to the seeding of grasses and legumes for forage, buffer vegetation will be planted during meadow preparation.

ODFW recommends seeding at a rate of 10 lbs/acre with three passes over the pasture with seeding equipment in different directions (30 lbs/acre total). This produces a well seeded meadow and does not result in all the plants growing in clearly defined, side-by-side rows (Bryan Swearingen, ODFW, 2003, pers. comm.)

Each elk meadow would be mowed or hayed every year in the late spring or summer. Vegetation should be removed if it is not being collected for hay or mowed with a rotary brush mower. A rotary mower should be used only two years in succession, then materials should be removed at least every year. Repeat operations. The build-up of vegetation can cause a significant decline in new plant growth if it is left to create a mat over grass. WACO Parks Department or a contractor hired by WACO would conduct this maintenance work. In the past local farmers have been contracted to hay some of the meadow areas. Contracts with local farmers are encouraged because of the benefits to the local community. Contracts should make sure that contractor would remove the cut vegetation completely and commit to do the work even if plants are wet and not good for hay baling. All work conducted within the Reclamation Zone must be coordinated with Tualatin Valley Irrigation District (TVID).

Elk meadows need to be assessed for weed treatment annually and treatment may be required every year. Typical weed species may include: tansy ragwort (*Senecio jacobea*), thistle (*Cirsium* spp.), Himalaya blackberry (*Rubrus discolor*), knapweeds (*Centaurea* spp.), and Scot's broom. Noxious weeds should be spot sprayed as needed in the late

spring/early summer. Weed control during the first year after seeding is critical. By treating weeds early before they become established maintenance in later years will be reduced.

Each meadow would require fertilization at least every 2 years and annual fertilization would be preferable for getting the most successful and healthy plant growth in the meadows. Meadows would get the most elk use as winter pasture, therefore any fertilizer should be applied in early fall, just prior to or shortly after fall rains have occurred. (Fertilization rates should be at 200 lbs per acre.) Elk meadows would have a buffer of vegetation to protect water quality from fertilizer runoff (see discussion of vegetative buffers below). Local farm supply stores can make fertilizer recommendations (type and application rates) based on the soil composition, PH, and the plant species being seeded. In general, a 16-16-16 fertilizer is a good overall product that develops both root systems and vegetation.

Following the schedule provided in Table 2.1-2, one meadow (or meadow complex) would be prepared and seeded (spraying, plowed/disc'd, seeded, and fertilized) each year. Meadows should be reestablished (spraying, plowed/disc'd, seeded and fertilized) at least once every 10 years. Elk meadows may need reestablishment more frequently depending on regrowth of non-palatable species. The ground should be packed down (during the seeding operation to seal the ground and retain moisture for seed germination) afterwards so elk will not sink down into the soft ground or be able to pull up young plants completely.

Table 2.1-2. Elk Meadow Rehabilitation and Maintenance Schedule

Meadow	Summer2004	Fall 2004	Summer 2005	Fall 2005	Summer 2006	Fall 2006	Summer 2007
1	D F	F W	M W		M W	F	M W
2	M		D F	F W	M W		M W
3	M		M		D F	F W	M W
4	M		M		M		D F
5	M		M		M		M
6							

Meadow	Fall 2007	Summer 2008	Fall 2008	Summer 2009	Fall 2009	Summer 2010	Fall 2010
1		M W	F	M W		MW	F
2	F	M W		M W	F	M W	
3		M W	F	M W		M W	F
4	F W	M W		M W	F	MW	
5		D F	F W	M W		M W	F
6				D F	F W	M W	

Meadow	Summer 2011	Fall 2011	Summer 2012	Fall 2012	Summer 2013	Fall 2013	Summer 2014
1	M W		M W	F	MW		D F
2	M W	F	M W		M W	F	M W
3	M W		M W	F	M W		M W
4	M W	F	M W		M W	F	MW

5	M W		M W	F	M W		MW
6	M W	F	M W		M W	F	M W

D = disc/plow, seed. F = fertilize. W = weed treatment. M = mow/hay.

The work shown on Table 2.1-2 may not be accomplished during the year shown due to funding limitations, but the schedule will be followed for the subsequent 10-year period once the initial work for each meadow had commenced. It is anticipated the work in all meadows will have been started by 2006.

2.2 Buffer Plantings

Two types of buffers zones are included in elk meadow rehabilitation: 1) herbaceous buffers along the reservoir edge, and 2) a woody vegetation buffer along portions of the elk meadows below the dam.

Vegetative buffers planted for water quality purposes will be located on the reservoir (downslope) edge of each meadow. These buffers would be mowed as part of meadow maintenance but would not be disced or fertilized to reduce the amount of contaminated runoff that could reach the reservoir. These buffers will be 100 feet wide and composed of native species of herbaceous vegetation. Spot spraying of weeds in the buffer zone would be conducted as part of general meadow maintenance.

ODFW requested that a woody vegetation buffer be established along the eastern and northern edge of meadow 4 near the boundary with Stimson Lumber Company and along the lake access road. The intent would be to provide a visual and sound screen between elk using the meadow and the vehicle traffic in and out of the lumber mill entrance road and the lake. This buffer would be 25-feet-wide and composed of native trees and shrubs. The overstory tree species should be conifers that are best suited to the site conditions. A conceptual planting plan will be prepared at a later date for ODFW review.

2.3 Estimated Rehabilitation and Maintenance Costs

The following are cost estimates provided to Reclamation by ODFW based on costs for similar wildlife habitat management programs. This list may not be comprehensive of all costs associated with maintaining elk pastures.

Table 2. Meadow Rehabilitation and Maintenance Costs

	Estimated cost per acre (w/labor, equip., and fuel)	Total estimated cost for 140 acres
Fertilizer	\$40.00	\$5,600
Seeds	\$25.00	\$3,500
Mowing	\$14.00	\$1,960
Discing/plowing	\$45.00 (fuel and labor only)	\$6,300
Weed control	\$25.00 (excluding labor)	\$3,500

The mitigation efforts are Reclamation's legal responsibility. Reclamation will enter into an agreement with WACO to address specific actions and funding. Funds will come from 1) Reclamation's appropriated budgets, 2) WACO's operating budget when the

work coincides with park operational requirements, and 3) from revenues generated at the park which may be used as a cost share for work in those meadows tied to recreation facilities. Volunteer labor will also be used whenever possible.

3.0 MONITORING PLAN

Because the intent of this management plan is to provide quality elk forage, it is necessary to evaluate the success of the program by monitoring elk use. Monitoring the use of elk meadows is an important part of an adaptive management approach. The 10-year RMP cycle will provide an opportunity to review the effectiveness of the elk meadow maintenance and management actions implemented in this RMP and provide a process to make maintenance changes for the next 10-year cycle. In the interim between RMPs, data of sufficient quality and quantity must be collected to make informed decisions in the future. Anecdotal reports of elk in the park by park staff, park visitors, TVID employees, and others, while important, are not rigorous enough to constitute monitoring. A consistent and repeatable protocol for monitoring must be established for the data to be useful in the future. The results of the monitoring need to be detectable, quantifiable, and show trends in elk use in the meadows. Carefully examining elk meadow use patterns at Hagg Lake can guide future changes in meadow maintenance as required.

Monitoring the use of the elk meadows and determining if management is having the desired effect is possible even with spotty baseline information. The rotating schedule of maintenance provides the opportunity to compare elk meadows that have been plowed/disc'd and reseeded with other meadows yet to undergo this level of restoration to determine if goals are being met. Reclamation, WACO, and ODFW have agreed to meet every two years to discuss the progress of the elk meadow maintenance and monitoring and discuss the plan for the next two year period between meetings. Adjustments to the maintenance and/or monitoring plan can be made if all agencies are in agreement. Additional information may be available from the ODFW from their aerial surveys, hunting records, and other activities. However, the elk population does not reside within the park all year. The resident populations of elk will/could be affected by other factors not under the jurisdiction of Reclamation or WACO.

Because it is difficult and time consuming to make systematic direct observations of elk use patterns, fecal pellet counts will be used as an index of elk use. Monitoring and data collection on ungulates through the use of fecal pellet counts began as early as 1940 (Bennet et al. 1940). This method has many advantages and will meet the goal of this plan by providing a quantifiable approach to documenting elk presence and use trends in the elk meadows. The monitoring plan would follow methods described in "Ground-based inventory methods for selected ungulates: moose, elk and deer" (Resources Inventory Committee 1998).

Transect lines will be placed 75 feet apart across the short axis of each elk meadow. On each transect circular plots (100 sq. ft., radius of 5.6 ft.) will be spaced at 50 ft intervals. The center point of each circular plot will be marked with PVC pipe sunk into the ground, and referenced with coordinates from a GPS unit. The GPS data will be entered into the existing GIS data layer of the elk meadows. Approximately 4-10 transects with 4-8 circular plots per transect would be placed in each meadow, depending on its size and

shape. The ends of the transects and the center of the plots should be permanently marked with PVC pipe set low enough that mowing equipment can safely mow over them. Reclamation, with input from ODFW, would assist WACO in the establishment of the transects and plots. The circular plots would be counted once every 2 weeks from October through February. After each visit the plots would be cleared of pellets.

Photos will be taken every year to monitor the condition of the meadows for successful vegetative growth of meadow and buffer vegetation. A protocol will be established prior to implementation to establish and identify photo points for consistent approach to photo documentation. Sample data sheets are included in Appendix A. The data sheet includes lines for recording the necessary data and a map that could be used to note other field observations such as elk trails, indications of bedding, or other use indicators. Collected field data will be supplemented by elk use patterns observed by WACO and ODFW staff.

A field crew of at least 2 people is needed to place transects, count and clear plots, and record data. Once the transects and plots have been established it should require one staff person one day to visit all plots and record the required data. A detailed description of the monitoring procedure will be provided to WACO and Reclamation will work with park staff to train WACO personnel on the monitoring procedure.

The following equipment will be required to establish and monitor pellet group counts:

- GPS unit
- Survey stakes (PVC to mark plot centers)
- Waterproof field notebooks
- Datasheets printed on waterproof paper
- Field measuring tape
- Metal cattle ear tags or rebar to mark ends of transects
- Flagging and permanent markers
- Camera and film (or digital camera)

4.0 Data Analysis and Reporting

The data forms used in the field and any additional field notes from monitoring crews will be submitted to Reclamation for analysis after each monitoring effort. Field data will be converted to an electronic format by Reclamation's Lower Columbia Area Office staff in Portland and can be provided in either MS Excel or as hard copies of the field data sheets and printouts of the Excel database.

The collected elk usage data will be analyzed statistically using Analysis of Variance (ANOVA) or a similar appropriate test. Biennial reports showing analyses and data trends will be prepared by Reclamation to be presented at biennial meetings with ODFW and WACO. A report will be prepared that summarizes the findings of the monitoring effort to date in narrative, graphic, and tabular formats as appropriate. Biennial meetings will give WACO, ODFW, and Reclamation a forum to discuss the progress of the elk meadow mitigation program and what, if any, changes might be needed. The cumulative results of the monitoring efforts will be reported in the next Hagg Lake RMP.

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Signatures

Ronald J. Eggers, Bureau of Reclamation, Area Manager
Lower Columbia Area Office

Date

Larry Eisenberg, Washington County Parks, Facilities
Manager

Date

Jeff Boechler, ODFW, Manager North Willamette Watershed District

Date

Example of Data Form

Henry Hagg Lake Elk Meadow Monitoring

Investigator's Names: _____

Elk Meadow Number: _____ **Date:** _____ **Time:** _____

Weather conditions (air temp., precip., cloud cover, etc.): _____

Transect 1

Lat/long or UTM coordinates. Start point: _____ **End point:** _____

Transect Length: _____ **Number of plots on transect:** _____ **Plot area:** _____

Record pellet groups counted below for each plot in transect 1.

P1: _____ **P2:** _____ **P4:** _____ **P5:** _____

Notes _____

Transect 2

Lat/long or UTM coordinates. Start point: _____ **End point:** _____

Transect Length: _____ **Number of plots on transect:** _____ **Plot area:** _____

Record pellet groups counted in each plot in transect 2 below .

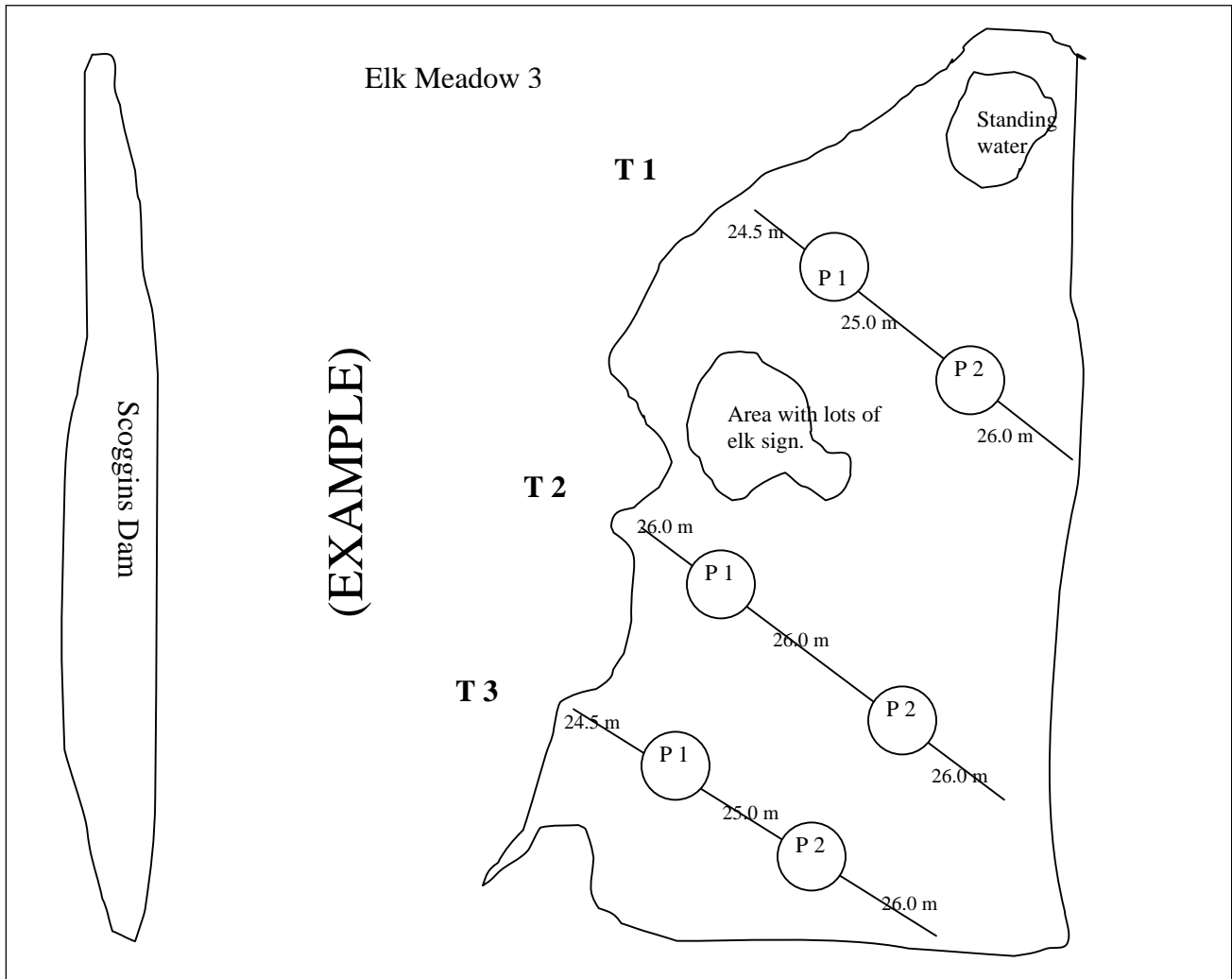
P1: _____ **P2:** _____ **P4:** _____ **P5:** _____

Notes _____

Describe photographs taken in this meadow _____

Back of data form

Sketch or photocopy the elk meadow in the space below from an aerial photograph and draw the approximate locations of transects, plots, and other geographical reference points.



Additional notes. Best access points, for example.

Appendix C

USFWS Consultation

Henry Hagg Lake Resource Management Plan: Draft EA

[Appendix C material is available as hardcopy from BOR.]

Appendix D

Tribal Correspondence

Henry Hagg Lake Resource Management Plan: Draft EA

[Appendix D material is available as hardcopy from BOR.]

